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TO CORRESPONDENTS.

W. E.—*Mr. Laming's address is Chemical Works, Isle of Dogs, Poplar, to which place your letter has been forwarded.*

G. J.—*The tax upon coals entering the port of London, denominated the "Orphan Dues," forms part of the revenues of the corporation, and may be reckoned at 1½d. per 1000 feet upon all the gas made in the metropolis; to which extent the gas consumers of the suburbs are contributors to the exchequer of the city of London.*

We are compelled to postpone the continuation of "The History of the Gas Meter," *and the conclusion of the review of Mr. Penfold's work on rating, as well as many other articles of less present interest than those contained in this monthly journal.*

NOTICES.

With the present number a thirty-two page supplement is issued, price 1s. 6d., containing the remainder of the proceedings before the committee of the House of Commons on the Great Central Gas Consumers' Bill, together with the detailed specification of the new works. Subscribers will be supplied with it on remitting the amount in postage stamps, or 7s. 6d. by those who have not paid their subscriptions for the current year.

Parties who receive the JOURNAL OF GAS LIGHTING *through Booksellers are requested to take notice that the Office for its publication is removed from* 21, *Paternoster-row, to* 88, *Cheapside.*

All communications and orders for Advertisements to be addressed to the Editor, 32, Bucklersbury, London.

The Terms of Subscription are:—

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Subscribers are reminded that the Subscriptions for the current year are now due, and they are requested to remit the same, by Post-office order, to the Proprietor. Those who desire that their remittances be acknowledged will please to enclose a postage stamp.

All back numbers exceeding three months' date will in future be charged double price, unless six or more consecutive numbers are taken at the same time. Nos. 6, 12, and 13 are nearly out of print, and can in future only be obtained with complete sets of the Journal.

The Editor will be particularly obliged by his friends forwarding to him Notices of all Meetings, Trials, or Appeals which it may be interesting to the Gas World to have reported.

Circular to Gas Companies.

A YEAR and a half has elapsed since we first deemed it our duty to draw the attention of Gas Companies in general, and of the Metropolitan Gas Companies especially, to the critical position in which they stood, and to urge upon some of them the necessity of large and comprehensive reforms in the system upon which their operations had hitherto been conducted, if they were desirous of retaining that measure of prosperity to which their enterprise and resources entitled them. The period which has since elapsed, has been an eventful one in the financial history of gas lighting, and has fully confirmed the views we entertained and developed in our number of February, 1849, and which, if now adopted at even this, the eleventh hour, might save a mass of property still valuable, but, for the destruction of which, the mine is already formed, the train laid, and the match ready to be applied. The illustrious statesman, whose premature loss this country and all Europe at the present moment deplores, earned his imperishable renown not only by the greatness and comprehensiveness of his administrative reforms, but by the entire absence of all petty jealousies, and his readiness to abandon his pre-conceived opinions and party connections for the common good. From influential individuals of varied interests we have had expressions of opinion in accordance with our own views on these subjects; but the master spirit which great crises in public affairs often produce, is yet wanting in the metropolitan gas world, and we are, in lieu thereof, presented with the humiliating spectacle of a Metropolitan Gas Company petitioning the House of Lords, under its common seal, for permission to be heard by counsel *in favour* of intrusion upon a neighbour, because, by a successful juggle, they have obtained a short respite from its immediate effects upon themselves. Such a course of proceeding will not for long prevent the inhabitants of Whitechapel High-street and other populous thoroughfares from obtaining a supply of gas at 4s., if they only exert the same indomitable energy, and show the tact of the citizens of London under similar circumstances, but will rather assist them with conclusive arguments in their favour. Expedients like these are dangerous and illusory. They may provide occasions for the exercise of that stratagetic diplomacy which protects its client by drawing off an enemy, and inducing him to expend his force on some other point. But some enemies are insatiable, and every conquest only serves to augment their strength, and render them more formidable hereafter, till, in the end, they absorb up all in their powerful grasp, or render their weaker neighbours tributary. An adversary such as this, the Great Central Gas Consumers' Company and its allies, appears to us likely to become to the Metropolitan Gas Companies; who if, instead of contenting themselves with watching the movements of the last autumn, each in the hope that they should be themselves spared from being the object of the first blow, trusting that it might fall upon its neighbour, had agreed upon some comprehensive well-digested plan of consolidation, in which the interests of the public would have been protected (the difficulties in the way of which are more apparent than real), and had gone before Parliament this session for its sanction to a bill which should have put the lighting of the whole metropolis on a basis in conformity with the spirit of the times, we doubt whether the limited project for the City of London alone would have been for one moment entertained. Our advice to this effect is upon record; and it is not without a warning from us that the most favourable opportunity for such an arrangement has been suffered to lapse.

Circumstances have changed now, though, perhaps, not to such an extent as to render all compromise impossible; yet, certainly, it could only be now effected on terms less advantageous than were practicable a year since. The Great Central Company may, or may not, obtain their act; but, even should they be eventually defeated this session, they have shown sufficient evidence of strength to warrant the supposition that a portion of the metropolis may, at an early period, enjoy the advantages of their professedly superior illumination; and hence they cannot be refused the option of being admitted into any amalgamation which may now be proposed. We believe the engagements they have contracted to be onerous, and their promises incapable of being fulfilled to the extent held out; it would therefore be but reasonable that the terms upon which they join should be, in some measure, dependent upon the extent to which experience supports their views. As for the works and property of the existing companies, there would

be little difficulty in estimating their present value, and their owners would, we presume, have no objection to the dividends upon that valuation being limited to the rate fixed by the Great Central Company.

Should no steps be taken before the next session of Parliament, by the parties most interested in maintaining the value of metropolitan gas property, it is easy to foresee the consequences. This year has witnessed the actual commencement of a course which must end in the partial, if not total, destruction of the capital invested in this branch of industry in the city of London. In the southern districts a movement is being organized, and Mr. Croll has virtually acknowledged his dissent from Mr. Pearson's opinion, that the City was the only section of the metropolis where gas could be profitably sold at 4s., by accepting the appointment of engineer to a company projected for the supply of gas at that price to a district requiring nearly 350 miles of mains, and where the consumption is less than 500 million feet a year, of which at least one-third is expended on public lights. East, west, and north the same feverish disquietude prevails, and, but for the attention of the leaders of the City movement being engaged at home in carrying their own scheme into practical effect, this feeling would have already broken out in some more menacing form. The danger is imminent, and can only be perverted by the adoption of decided measures.

The return made by incorporated gas companies, in compliance with Mr. Hume's motion, has not yet been printed, nor are we able to ascertain the cause of this unusual delay. In alluding to this subject last month we mentioned that the Bristol and Clifton Gas Company had reduced their prices; but we ought to have stated that both the companies supplying that city had simultaneously adopted that course. Another and more unexpected reduction from 6s. to 5s. has since been announced in a provincial town on the coast, to take effect as soon as the Commissioners shall have liquidated the arrears of nearly £3000 due for eighteen months' public lighting. One of the surveying officers of the Board of Health having lately visited the town in question, and made some enquiries relative to the gas works, which are embodied in his printed report, and consequently become public property, we are at liberty to refer to them as showing what *may* be effected by leaving the supply of gas in the hands of one company, subject to such restraints and control as public opinion in the present day imposes, and as indicating what *ought* to be the policy pursued by a gas company so circumstanced.

The supply of gas from the works in question, having oscillated for some years between the amateur surveillance of a colonel of engineers, and the necessities of a speculating contractor, screwed up to the highest rent which could be wrung from him, and in his turn doling out in uncertain quantities his filthy trash at the maximum rate, the consumers rose up in arms in 1847, and applied to Parliament for power to establish a consumers' gas company. The price was then 9s., which the new company proposed to reduce to 6s. The formidable nature of the opposition opened the eyes of the proprietors to the danger of their position, and they at once decided to meet the crisis by lowering the price to 6s., and placing their works under the charge of an experienced superintendent, who not only knew how to make good gas, but to instruct the public how to consume it, and to apply it to purposes of which they were hitherto ignorant. The committee which sat on the bill heard the evidence of the promoters, which amply sustained their case, both in respect of price, quality, and irregular supply; but, adopting a course different to Mr. Cardwell and the Great Central committee, they declared the preamble not to be proved, on the old company pledging themselves that they would next year come to Parliament for a bill by which they should be bound to a maximum price of 6s. This bill was obtained in the succeeding year, and in 1850 we find them voluntarily, and without pressure, offering a further reduction of 16 per cent. on the reasonable condition before mentioned. From the surveying officer's report we ascertain that the annual make of gas is now about 27 million feet, of which 10 million feet are supplied to the public lamps at 4s.; 12 are consumed by private consumers, and 5 are lost by leakage or otherwise unaccounted for. Coals cost 15s. per ton, and coke sells at 12s. per chaldron (19s. per ton). The mains are 24 miles in length, and the capital employed is £32,000. Had the new bill been granted, £60,000 would have been expended in the two concerns, and 6s. must have remained as the stereotyped price of gas for all time, when once the exhaustion arising from a ruinous competition, had been succeeded by an amalgamation. It might be invidious to cite the many instances where this has been the result; they are, however, on the tongue of every one acquainted with the statistics of gas lighting, and need only now to be glanced at, as confirming the position we have so often maintained, viz., that cheap gas was more surely obtainable by the operation of the pressure of public opinion on the proprietors of the existing works, than by violently promoting a senseless competition which, in course of time, was certain to become a monopoly in an aggravated form.

Our columns contain another example of one of those wayward decisions of a Court of Quarter Sessions in regard to the rating of the main pipes of a gas work, to which we have before drawn the attention of our readers. Upon the same evidence which had induced one court to value the whole property at a rental of £13,602, another court in a different county, increases it to £16,089; and, although the effect of this decision is to reduce the rating of the particular portion of the property in question from £682, at which the parish had valued it, to £326, yet the bench, while admitting that the appellants had fairly interpreted the law as it stands, bungled in its application, and because it so happened that some portion of the property in other counties and parishes might have been rated too low, they carried that deficiency to increase the value of the particular portion under investigation, telling the parties in effect that, when the other parishes had obtained what was their due, application might again be made to lower the amount upon which they had then adjudicated. The rates payable under the assessment made by the court will amount to about 2¾d. per 1000 feet on the gas made. Mr. Croll's estimate for this department of the expenses of a metropolitan gas works is 1½d. per 1000 feet.

Communicated Articles.

ON RESIN AND WATER GAS.

BY ANDREW FYFE, M.D.,

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Though, during the course of the last year, I had been engaged in conducting experiments on water resin gas, I did not think it necessary to make the results public, because, after what had been stated in scientific journals, and especially in the JOURNAL OF GAS LIGHTING, I had thought that the proposal to introduce this gas, for the purpose of illumination, had been abandoned. The very remarkable statement advanced in the journal for April last by Mr. White, patentee for a process of manufacturing the gas, shows, however, that this is not the case; but that, on the contrary, he still maintains not only that the process is an economical one, but also that the gas afforded is of high illuminating power, and consequently that it is cheaper than other gases are as a source of light.

The appended remarks in the same number of the Journal, are sufficient proof of the inaccuracy of some of Mr. White's statements, and of the little prospect there is of water resin gas, *as manufactured by him*, coming into use, especially in those places where coal is to be had at a reasonable price; I trust, however, notwithstanding what has been already advanced regarding the process, that the few observations which I am now about to submit, the result chiefly of experiments, will not be deemed valueless. I give them, because it is a subject of such vast importance, that I consider it to be the duty of every one, who has any information, regarding it to make it public; and then to allow those, who are qualified to judge, to say whether attempts to introduce this gas, as an economical source of light, ought still to be persevered in.

It is well known that when water is passed over iron at a red heat, excluded from air, it is decomposed; oxide of iron is formed, and hydrogen gas is evolved, the purity of which depends on the kind of iron employed. Were the iron clean and pure, then pure hydrogen would be the result; but this very seldom occurs in practice, because, not only does the iron contain foreign ingredients, but it is soiled also by the hands and tools of the workmen in the factory from which it is procured, in the state of filings or turnings. Hence it is, that the specific gravity of the gas which it yields is considerably beyond that of pure hydrogen, and the appearance of the flame is different. The light afforded is extremely faint.

When water is passed over carbon, either as coke or charcoal, at a red heat, and excluded from air, decomposition ensues, and a gaseous fluid escapes, with regard to the nature of which different opinions have existed. It was at one time supposed to be, and indeed in works on chemistry it has been described, as a mixture of a variety of gases, the principal of which is light hydro carbon, better known as *marsh gas, coal mine gas*, and *fire damp*. More recently-performed experiments, however, have proved that it does not contain hydro carbon, or at most but a trifling quantity of it. In a paper published by me in the "Edinburgh Philosophical Journal," July, 1837, it is shown that the gas produced by this process is a mixture of

hydrogen, carbonic oxide, and carbonic acid, the proportions varying according to the heat and other circumstances. In these trials I found that the carbonic acid was about 18 per cent. After removing it, the remainder was of specific gravity 470, and consisted of a mixture of hydrogen and carbonic oxide, in about equal proportions. By combustion it yielded carbonic acid and water, the light afforded being extremely feeble. As the gas, after the removal of the carbonic acid, was of specific gravity 470, it must have been, before its removal, of specific gravity about 660.

Allowing the correctness of the results now stated, it is evident, that when water is brought into contact with iron and carbon at a red heat, in the same vessel, the gas evolved will be either hydrogen alone, provided the whole of the oxygen unites with the iron; or it will be a mixture of hydrogen, carbonic oxide, and carbonic acid; the proportions varying according to the surface of carbon and iron exposed, and to the facility with which the vapour of the water is brought into contact with the one or the other. Of course the specific gravity will also vary according to circumstances. I have already said that both carbonic oxide and hydrogen burn with a very feeble flame and give very little light. The appearance of the flame of the mixed gases will, of course, vary according to the proportions.

The following experiment was made with the view of ascertaining the illuminating power of the gas prepared from water by the process recommended by Mr. White, though not exactly with the same arrangement. The retort used was the one which I employed in my trials with coal gas, previously recorded. It was stuffed with charcoal and scrap iron, which were brought to the proper temperature after the door of the retort was secured. Water was then allowed to flow in, the supply being regulated by a stopcock. The gas given off was measured in the usual way. From 7½ lbs. of water 59½ cubic feet of gas were evolved, the specific gravity of which was 574. By lime water the condensation amounted to 16·5 per cent., indicating, therefore, that quantity of carbonic acid; that is, about ⅙th of its volume. Had the specific gravity been taken after abstracting the carbonic acid, it would have been found to be very nearly the same as that formerly mentioned, that is, between 470 and 500. The gas burned with a very feeble bluish flame, yielding carbonic acid and water. With a flame 5 inches long from a jet with an aperture of 1-33rd of an inch, the consumption was 1 foot in 32 min. 30 sec.; that is 1·84 foot per hour.

The illuminating power was tried by the method described in No. 6 of this Journal, using the argand with 56 holes, having a button to spread the flame. The standard light was a wax candle, six to the pound, consuming 140 grains per hour. The argand burned 1 foot in 5 min. 50 sec.; that is, very nearly 10 feet per hour. The spot on the Bunsen screen disappeared when the distance between it and the candle was 40 inches, and that between the screen and the gas burner was 6 inches, and $40 \times 40 \div 6 \times 6 = 44$. The wax candle was, therefore, giving forty-four times as much light as the burner consuming 10 feet per hour, evidently showing that water gas, thus manufactured, is valueless for the purpose of illumination. This trial of the illuminating power was made on the gas without having abstracted the carbonic acid, which, it has been stated amounted, to upwards of 16 per cent. This, I would say, is a defect in the process for procuring water gas as originally introduced by Mr. White, and hence, in all probability, the cause of the great specific gravity of the gas as stated by him. Had the gas been freed from carbonic acid, *as it ought to have been*, by putting it through lime purifiers, the specific gravity would have been much less; but this would not only have diminished the quantity evolved from a given weight of material, but also would have reduced materially the specific gravity, which it is of consequence to have as high as possible, when specific gravity is given as a test of the illuminating power. This also shows the extreme absurdity of putting any confidence in specific gravity alone, as a test of the value of a gas for the purpose of illumination.

Before leaving this part of the subject I may advert to an opinion entertained by some, viz., that durability alone is a good indication of the value of gas. In this instance the durability was 32 min. 50 sec. That of the gas from the best English caking coal I have formerly stated to be 50 min., and that from an average Scottish cannel coal to be 60 min. By the most advantageous modes of combustion 10 feet of the English gas gave the light of 27·3 candles; of the Scottish gas, the light of 60 candles; while the same quantity of water gas gave that of only $\frac{1}{45}$th of a candle. The illuminating power and durability, therefore, bear no proportion whatever to each other; consequently, durability alone gives no indication of the illuminating power of gases.

The next set of experiments was made on resin, with the view of ascertaining the quantity and quality of the gas which it affords, by decomposition at different degrees of heat. The resin was melted cautiously, and poured into the reservoir connected with the retort, previously brought to the same heat as that requisite for the manufacture of coal gas. By a proper contrivance it was kept warm and sufficiently fluid to enable it to flow easily. 6 lbs. 2 oz. yielded 61 feet of gas; that is, very nearly 10 feet from the pound. The gas was of specific gravity 640. Lime water indicated 10 per cent. of carbonic acid. With a jet 1-33 of an inch in diameter, and a 5-inch flame, the durability was 50 min.; that is, 1·2 feet per hour. By the photometer the jet gave the light of 2·2 candles per foot. The argand with 56 holes, consuming 5 feet per hour, gave the light of 2·45 candles per foot.

This gas, being of specific gravity 640, a cubic foot would weigh 343 gr. The gas therefore, in all, weighed nearly 3 lbs.; consequently upwards of one half of the resin employed was wasted by the deposit of carbon in the retort, and by the distillation of volatile oil.

A second trial was made with the retort at a dull red heat. 2 lbs. 8 oz. of resin gave 16½ feet of gas of specific gravity 657, and containing 6 per cent. of carbonic acid. This is equal to 6·2 feet per pound of resin. The durability, with a jet 1-33 of an inch in diameter and 5-inch flame, was 48 min., that is, 1·25 feet per hour. With the jet flame the light was that of 1·68 candles per foot; with the argand it was that of 2·27 candles per foot.

The specific gravity of this gas being 657, a cubic foot would weigh 352 gr., which would make the total quantity be 5808 gr. the resin employed was 18,664 gr., consequently, two thirds of it had disappeared as deposited carbon and volatile oil.

A third trial was made with the heat rather higher than in the second, but lower than in the first experiment. 7 lbs. 6 oz. of resin gave 64 feet of gas of 419 specific gravity, and containing 8 per cent. nearly of carbonic acid; that is, equal to 8.42 feet per pound of resin. With the jet the durability was 41 min. 40 sec.; that is, 1·43 feet per hour. In this case the loss also amounted to upwards of one half of the resin employed.

A fourth trial at nearly the same heat was made. 6 lbs. of resin afforded 55 feet of gas of 613 specific gravity; that is, rather more than 9 feet per pound. In this case the loss amounted to upwards of one half of the resin.

Of these four trials the first is by far the best, not only as to quantity, but also as to quality of the gas afforded, a pound of resin having yielded 10 feet of gas, the illuminating power of which was equal to that of 2·45 candles per foot. This is very nearly the same as that of the best English caking coal gas, to which I alluded in No. 9 of the Gas Journal.

From the above trials it would appear that, during the conversion of resin into gas, there is a considerable loss. I was anxious to ascertain whether this was owing to any imperfection in the apparatus, or whether it always accompanies the decomposition. I was fortunate in having an opportunity of putting this to the test, by having been obligingly offered the use of an apparatus erected under the superintendence of Mr. White himself, for the purpose of supplying water resin gas, according to his patent process, to a private dwelling-house. The apparatus was a very small one, consisting of two retorts, the one vertical, for the decomposition of water, the other horizontal, for the decomposition of resin. In the following trial the resin retort only was used. 5 lbs. of resin, cautiously melted, afforded 44 feet of gas of 574 specific gravity; that is, 8.8 feet per pound. The per centage of carbonic acid was not ascertained. From the low specific gravity it was, perhaps, not great. The condensation by chlorine was 8. The durability with the jet and 5-inch flame was 53 min. 20 sec.; that is, 1·12 feet per hour. With this jet, the light was that of 1·14 candle per foot. Owing to a deficiency of pressure on the gasholder, I could not get a sufficient supply of gas to enable me to ascertain the illuminating power by the argand. I could not make it consume beyond 3 feet per hour, which was too small a quantity to have profitable combustion. I have previously shown that, for the consumption of equal quantities, the light given by a good argand is to that given by a jet as about 1·8 to 1. Giving this gas, then, every allowance, the illuminating power by the argand could not exceed that of 2 candles per foot.

In this trial, the gas being of specific gravity 574, a foot would weigh 307 grains, and therefore in all 13,530 grains. The resin used was 35,000 grains, consequently the loss amounted to nearly 3-5ths. There was no distillation of volatile oil, the loss must therefore have been occasioned by the deposit of carbon; and as the loss was as great as when the other apparatus was used, and as the gas afforded was inferior in quantity and quality, I conclude that my own apparatus was equally good with it, for the decomposition of resin.

The composition of resin is 10 atoms carbon, 7 hydrogen, and 1 oxygen; the compound atom weighing 75, to that of hydrogen as 1. When decomposed by heat, were each atom of hydrogen to unite with an atom of carbon, they should yield 49 of olifiant of specific gravity 976. Resin, therefore, cannot afford beyond 65 per cent., say 2-3rds of its weight of heavy hydro-carbon gas, with perhaps the addition of a small quantity of carbonic oxide, and carbonic acid. But the gas afforded by the decomposition of resin, in the trials now recorded, even though it contained carbonic acid, was never of greater specific gravity than 657; there must, therefore, have been a large amount of light hydro-carbon, or a considerable quantity of uncombined hydrogen in it. It is in this way that we can account for the loss, even when there is no volatile oil distilled over. Each atom of light hydro-carbon gas that is formed, leaves an atom of carbon uncombined, because the hydrogen, in this case, takes up only half the quantity of carbon that it does, when it unites with it to form olifiant gas. When any of the hydrogen escapes uncombined, then two atoms of carbon are left for each atom of hydrogen evolved; and as the weight of the carbon atom is 6 compared to that of hydrogen as 1, we observe why the loss is so great when an escape of light hydro carbon, and especially of free hydrogen takes place. Most probably there is not much escape of free hydrogen, the gas evolved, independent of carbonic oxide and carbonic acid, consisting chiefly of olifiant and light hydro carbon. The olifiant in the trials now mentioned amounted to 8 per cent., the carbonic acid to about 6 per cent., leaving about 86 for the light hydro

carbon, or upwards of ten times the volume of the olifiant. Let us take a more favourable view of the case, and suppose that the light hydro carbon is only six times the volume of the olifiant; then one atom of the hydrogen will take one of carbon to form olifiant, while the remaining six of hydrogen will take only three of carbon, thus leaving six of carbon, and allowing that the one of oxygen will unite with one of carbon, to form carbonic oxide, and which is the utmost that it can unite with, then there will still remain five of the carbon in the retort. This amounts to 40 per cent. of the weight of the resin. I do not give this as what really occurs, but merely to show that there must be a great loss by the *present mode of decomposition*, and how we can account for the loss. Hence it is that we do not get so much gas as we should expect. I have said that the quantity may be considered to be from about eight to ten feet per pound. In the trials made by Professor Daniell the quantity did not exceed nine feet, and the perfection of his apparatus is admitted by all.

The deposit of carbon, to which I have now referred, is a source of very great inconvenience, from its choaking up the retort, and preventing the proper decomposition of the resin. Hence the necessity of frequently cleaning out the retorts.

In the instance to which I have referred, in preparing the gas according to Mr. White's plan, it was recommended, with the view of getting the resin to be more easily melted, and, when melted, to flow more easily into the retort, that it should be mixed with refuse from the kitchen, such as waste pieces of fat and dripping, &c., all which, being, as it was said, of no value, would increase the quantity of gas, and thus lessen the price of the raw material. I presume that no one will admit the truth of this statement. Cooks generally require all the waste fat and dripping they can get; and if these be removed, something else must be supplied, perhaps at a greater price. In manufacturing the gas with Mr. White's apparatus, to which I have referred, this practice was almost always followed. I was, therefore, anxious to test the quality of the gas thus afforded, and was kindly permitted by the proprietor to do so. In the trial the resin retort only was used, and the individual in the custom of manufacturing the gas had charge of the heating, &c.: 2¾ lbs. of resin and 2¾ lbs. of tallow were employed. After being cautiously melted and thoroughly mixed, the liquid was decomposed in the usual way, and afforded 43 feet of gas of specific gravity 716, that is, 7·8 feet per lb. It contained 8 per cent. of carbonic acid. The condensation by chlorine amounted to 13·25. The durability with the jet and 5-inch flame was 54 min., that is 1·1 foot per hour. With the jet the light was that of 1·4 candles per foot. Giving it the advantage of the argand, the light would, perhaps, have been about that of 2·5 candles per foot.

This gas, the specific gravity of which was 716, weighed therefore in all 16,500 gr. The resin and tallow together weighed 38,500 gr. The loss was therefore nearly one half of the materials employed in its manufacture.

Similar trials were made with oil alone with my own apparatus, the retort having been brought to the usual degree of heat. Six and a half lbs. of oil yielded 51 cubic feet of gas of specific gravity 806; that is 7·8 feet per lb.; with the jet, the durability was 68 min. 20 sec., that is 0·87 of a foot per hour. It contained 6 per cent. of carbonic acid. By the jet the illuminating power was 3·75 candles per foot; by the argand, 5·6 candles per foot.

The gas being of specific gravity 806, and 51 feet from 6½ lbs., the loss was upwards of one-half of the material employed in its manufacture.

It is generally allowed that, by cautiously conducted trials, a gallon of oil will yield about 100 feet of gas; but this is seldom obtained in practice, unless when the gas is of inferior quality; for, it is well known that, by a particular mode of decomposition, a large quantity of poor gas may be procured. I have seen oil gas of specific gravity 940. That referred to by Dr. Henry, in his trials with it, was 906. In numerous trials which I made, many years ago, at the oil gas works at Leith, and also with a small apparatus erected for lighting a manufactory in Edinburgh, I did not find the specific gravity to be beyond 710. In some instances it was only 645. The gas of specific gravity 710, was at the time considered to be of good quality. The condensation by chlorine amounted to 32 per cent. The quantity of gas obtained from a given weight of oil was not ascertained, but let us suppose that it came up to the full allowance, that is 100 feet from a gallon, then the loss amounted to nearly one-half. Taking the gas of specific gravity 906, there must have been a loss of about one-third, supposing that 100 feet were procured from the gallon; but of this I have my doubts. I am inclined to think, that *in practice*, there is in the conversion of oil to gas, a loss of about one-half; and that, therefore, in the trials which I have recorded, the loss was not greater than that which usually occurs. If it be thus with oil, I suspect it will be found to be at least to that extent with resin. In Mr. White's statement (No. 15 of JOURNAL), 10,000 feet of gas are got from 6 cwt. of resin, with an additional quantity of water. It is understood that Mr. White's gas contains about equal volumes of resin gas and of water gas, very frequently more of the latter; therefore, from the 672 lbs. of resin, about 5000 feet of gas are got, that is 7·4 feet from the pound. The gas is said to be of the specific gravity 924, if so, the loss is nearly one-half. If we take the appended statement, viz., that the quantity of resin used was upwards of 7 cwt., then the loss must have been much greater.

I come now to consider the quality of the water-resin gas, or, as it is very improperly called, the hydrocarbon gas, and its value for the purposes of illumination. This gas is generated by the decomposition of water and of resin in separate retorts; the former being decomposed by heat, the latter by heat with the aid of carbon and of iron. If what I have already said be correct, it is evident that the gas thus produced is merely a mixture of resin gas—that is of a gas resembling coal gas in its composition—and of hydrogen, with variable proportions of carbonic oxide and carbonic acid, according as the water is decomposed. I regret that I cannot give the results of the manufacture of the gas by the apparatus erected under the superintendence of Mr. White, as I fully expected to have been able to do. In the different attempts which I made to ascertain the quality of the gas manufactured by that apparatus, several circumstances occurred to prevent me from arriving at the truth. In the first trial I found the gas of high illuminating power, but it was afterwards ascertained that tallow was mixed with the resin; in what proportion I did not hear. At my next visit the gas was made by using both retorts, employing resin for the one, and water for the other; but it was afterwards discovered that the water retort was not in action, consequently the gas collected was entirely that from the decomposed resin, or a mixture of resin and tallow. I was obliged, therefore, at that time, to give up the attempt, not from any unwillingness on the part of the proprietor, for he was extremely anxious to ascertain the truth, but from the difficulty of getting the apparatus into proper working condition, though it had been erected for a very short time. This put a stop to future proceedings. I do not, however, consider this of great consequence. I have ascertained the quality of resin gas, of gas from mixture of resin and tallow, and of water gas, *separately*, and as these, by Mr. White's process, are generated in separate retorts, we must consider the gas thrown into the gasometer, to be merely a *mixture* of those mentioned, in variable proportions, according to the proportions of the articles employed in their manufacture, and the rapidity with which the one and the other is decomposed. We can thus arrive at the quality of the hydrocarbon gas, as it is called, and its consequent expense for the purposes of illumination, as compared with other sources of light, as, for instance, with coal gas.

I have already said, that as resin is composed of C. 10, H. 7, O. 1, the utmost that it can yield of olifiant is 49; of light hydrocarbon, about 28 from 75 of resin; that is, about 64 per cent. of the former, and about 37 per cent. of the latter. But resin never yields olifiant only: independent of carbonic acid and oxide, the gas is a mixture of olifiant and of light hydrocarbon, with perhaps a slight admixture of uncombined hydrogen. I have shown that the gas, when it contains about 6 per cent. of carbonic acid, varies in specific gravity from about 570 to 660. I have never found the condensation by chlorine to exceed 8 per cent., thus making the composition to correspond with the specific gravity; for a gas composed of 8 of olifiant and 92 of light hydrocarbon would be of specific gravity a little above 600. I have no doubt that resin gas, when free from carbonic acid, will be found to be of about that specific gravity. I have stated the specific gravity of the water gas, as generated by Mr. White's process, to be about 574. Supposing that it is mixed with an equal volume of resin gas, then the specific gravity ought to be about 580, or somewhere between that and 600; that is, presuming the absence of carbonic acid. Supposing the per centage of carbonic acid to be about 6, then the specific gravity would be about 630.

I must confess that I am at a loss how to reconcile this with the very remarkable statement made by Mr. White, in the GAS JOURNAL for April last. It is there said that the gas manufactured from *resin and water* is of specific gravity 924, and contains 12½ per cent. of olifiant. A gas having 12½ per cent. of olifiant, the remainder being water gas or light hydro-carbon, would not exceed 650 in specific gravity. His gas, therefore, must either have contained much more olifiant; indeed, have been composed almost entirely of olifiant, or must have had a very large admixture of carbonic acid or carbonic oxide. Resin gas, I have said, did not, in my trials, contain beyond 8 per cent. of olifiant. The high specific gravity of his gas must, therefore, have been occasioned by carbonic acid or carbonic oxide, perhaps by both, the latter of which is valueless for the purpose of illumination, and the former detrimental.

With regard to the illuminating power. I have never been able to manufacture gas from *resin alone* with more than 8 per cent. of olifiant. Mr. White states that, by his improved process, he gets the gas from *resin and water* with 12½ per cent. of olifiant. How is it possible that, by the addition of resin gas to another gas of lower specific gravity and illuminating power, he gets a gas of higher illuminating power and greater gravity? To me it is a puzzle. I wish much that he had entered more minutely into a description of his improved process, and had also stated his method of ascertaining the specific gravity, the illuminating power, and the per centage of olifiant.

That there is a large admixture of carbonic acid in Mr. White's gas, when he takes the specific gravity, appears certain from what he has stated in the paper referred to. He says that now there is but little carbonaceous deposit in the retort, owing to the peculiar mode of arrangement and admission of the hydrogen and carbonic oxide. Now, as by the manner of decomposing the water, oxide of iron is formed in the retort, it is evident that the whole of the oxygen of the water is not converted to carbonic oxide, by its union with carbon; the specific gravity of the gas, therefore, which is evolved from the water

ought to be below 522, which is that of a mixture of equal volumes of carbonic oxide and hydrogen; but, suppose that it is not much below that, and that no carbonic acid is present, then to get from resin and water, a gas of specific gravity 924, containing olifiant, with the residue composed of equal volumes of hydrogen and carbonic oxide, which it should be were all the oxygen disengaged as carbonic oxide, there ought to be about 87 per cent. of olifiant. Supposing that Mr. White's gas was a mixture of olifiant, carbonic acid, and water gas, which contains equal volumes of carbonic oxide and hydrogen, and that the water gas is about 522 specific gravity, and that the olifiant was 12½ per cent., then, to have it of the specific gravity 924, it should be about 12·5 olifiant, 52 water gas, and 35 carbonic acid. Were the carbonic acid removed from this gas the specific gravity would then be a little above 600, most probably the real specific gravity of the *inflammable* gas obtained from resin and water together.

With regard to the illuminating power of the water resin gas, Mr. White has stated that "it is 26·5 per cent. superior to Manchester cannel gas, and 20·5 per cent. to the Salford cannel gas." In my paper published in No. 1 of this Journal I have shown that these cannel coal gases are nearly of the same quality, and contain 7·6 per cent. of olifiant.

By the chlorine test, independent of durability, the illuminating power of Mr. White's gas, containing 12·5 of olifiant, ought to be 64 per cent., instead of 26·5 and 20·5, beyond that of the coal gases he mentions. Of course, if we take durability also into account, the value should be greatly beyond that.

The specific gravity of the Manchester gas at the time I tried it was 451. I have formerly shown that the durabilities, with the same burner, are as the square roots of the specific gravities. Taking durability into account also, the illuminating power of Mr. White's gas ought to be at least 90 per cent. greater than that of the Manchester gas.

It is evident from this, either that Mr. White's gas must be one *sui generis*, or that there is some strange inaccuracy in the mode of ascertaining the quantity, and of testing its qualities. Can it be that the quantity of gas evolved, say 10,000 feet, of specific gravity 924, from 6 cwt. of resin and 24 gallons of water, and which I have said is a mixture of olifiant, light hydrocarbon, carbonic acid, and carbonic oxide, with perhaps a little hydrogen, was the quantity indicated by the meter, immediately after the gas escaped from the retort, and was then of the specific gravity stated, and that, after it had stood over water in the gasholder for some time, and by which it would lose its carbonic acid, it *then* contained 12·5 of olifiant? If so, the quantity of gas valuable for the purpose of illumination must, by the abstraction of carbonic acid, be far below what Mr. White states. Be that as it may, till Mr. White describes more minutely than he has done, his method for finding the quantity and quality of his gas, I must adhere to the conclusions which the trials I have now recorded warrant, viz., that the quantity and quality of gas, after being properly purified, will be found to be far inferior to what Mr. White has stated; that in all probability the quantity of gas from *resin* will in practice not exceed 8 or 9 feet per pound, that is, about 1000 feet per cwt.; that the gas after being purified will be of specific gravity not much beyond 600; the condensation by chlorine not beyond 8 or 9 per cent.; a foot of it not giving more than the light of from 2½ to 3 candles. If so, then, when that gas is mixed with about its own volume of water gas, no doubt the quantity will be increased, but to the *serious deterioration of the illuminating power*. That of the water may be said to be *nil*, or a very near approach to it; consequently the reduction in the illuminating power of the other will be just in proportion to the addition; indeed, were it not that the water gas adds to the quantity, and perhaps, from the peculiar mode of generating it, also adds to the specific gravity, of which, as an indication of the value, some have a high opinion, I strongly suspect that Mr. White had better dispense with it altogether, and thus save the trouble and expense of manufacturing, and of storing and transmitting to the public, an article which, for the purpose of illumination, is, as now generated, absolutely useless.

After what has been said, I scarcely think it necessary to advance anything with regard to the expense of manufacture, and the supposed economy of water resin gas, as a source of light. If I am correct in my assertion, that 1 cwt. of resin will yield 1000 feet of gas, of illuminating power equal to that of the best English caking coal gas, or of the Lancashire and Yorkshire cannel coal gas, while the cost of the raw material for the manufacture of the former is at present 3s., and for that of the latter at Manchester is about half that sum, then there must be an enormous saving by the sale of the products of distillation to make up for the difference. While much saving must result from shortening the time, yet, to drive off the same quantity of gas, it will be found that very nearly the same amount of heat will be required, and, consequently, nearly the same consumption of fuel will be necessary. With regard to the saving from the products of distillation, I am not prepared to speak—but this is not necessary; enough has been said, in the April number of the Journal, to prove the absurdity as to the value put upon them by Mr. White.

Since writing the foregoing, some papers have unexpectedly been sent to me, regarding hydrocarbon gas, containing statements, on one of which in particular I feel called on to make some remarks. Referring to the hydrocarbon gas, as *made in the neighbourhood of Aberdeen*, it is said to be "of specific gravity 936, and shows an illuminating power superior as compared with the Aberdeen gas of 33·1 per cent. With the chlorine test, it shows an illuminating power of 28, while the Aberdeen gas shows only 14, and its durability, burning at 7-10ths of an inch pressure, is 82·30 to 61·40 Aberdeen gas." This paragraph appeared in an Aberdeen newspaper a twelvemonth ago, and now forms part of a manifesto issued by Mr. White, dated May, 1850. The gas there alluded to was that experimented on by me, when I first visited the water resin gas apparatus erected by Mr. White. The results stated are certainly correct, in so far as they are the results obtained by me, *with the gas on which I then experimented*. I did not take any notice of this paragraph at the time, not being in the custom of replying to newspaper observations. I cannot now, however, allow it to pass unnoticed, especially as it forms a part of the "puff direct" by Mr. White, and also, as it is well known here, that the experiments were made by me. Were no allusion made to it, it may appear that I have sanctioned this statement of the very high value of the hydrocarbon gas, as proved by my experiments. With regard to the trial referred to, I have already said that I had got permission to try the quality of the water resin gas, manufactured by Mr. White's apparatus. I had expected that I should witness its preparation; but on my arrival, I found that this could not be accomplished, and was therefore obliged to *test gas previously manufactured*. I was certainly surprised at the very high specific gravity and illuminating power, and said so at the time, and expressed my desire to have another trial. It was not till afterwards that I was informed that, instead of *resin only*, a *mixture of resin and tallow* was employed; in what proportions was not stated. Still, making allowance for this, I was not satisfied that these, with the addition of water gas, should afford a gas of such high illuminating power, and I again requested to be permitted to test the quality of the gas, on condition that I should be allowed to witness the whole proceedings. This was obligingly granted. At my next visit, the retorts being heated, and being aware that it would make no difference in the quality of the gas, whether the resin gas and water gas were prepared at the same time, or were manufactured the one after the other, I suggested the propriety of adopting the latter method, that I might have the opportunity of ascertaining the proportions of the gases from the different materials, more especially as I had my suspicions that the supply of water gas was deficient. The resin gas was accordingly first made. We then proceeded to the manufacture of the water gas, but *not a particle came off*. Everything was done that could be devised, but without success; we were, therefore, obliged to desist. On drawing the fire to enable us to examine the retort, we found that it was cracked, and, consequently, the gaseous matter, if any was formed, had escaped into the fire. The gas collected in the gasholder was, therefore, not water resin gas, but that from *resin alone*.

With regard to the gas referred to in the paragraph quoted, and which is stated to be hydrocarbon gas (that is water and resin gas), I maintain that *it did not contain a particle of water gas*. It was not even resin gas: it was procured from a mixture of resin and fat; the *latter*, I have no hesitation in saying, in *by far the largest proportion*. Strange that that gas, said to be water resin gas, should be of specific gravity 936, contain 28 of olifiant, and have durability 82′.40″; while gas which I saw prepared by the same apparatus, from a mixture of equal parts of resin and fat, should be only of specific gravity 716, have 13·5 of olifiant, and durability only of 54′. Does not this show that I am correct in saying, that the gas thus blazoned forth as water resin gas, was prepared from fat and resin only, the *former in very large proportion*.*

There is only one other circumstance to which I would advert, also stated in the papers referred to. It is often said that the most important part of a letter is contained in a postscript, and in one of the printed papers issued by Mr. White there is a P.S. which is certainly very important, because it is contradictory of a previous statement, and seems to let out the secret regarding the enormous quantity of gas obtained. He there states, "One cwt. of resin yields by my system, if *wrought up*, 2000 feet of gas or more, possessing an illuminating power 26½ per cent. superior to Manchester gas. I find it, however, more economical not to convert the whole of the resinous matter into gas;" "it may be found more profitable not to push the quantity of gas beyond 2000 feet from each cwt. of resin, although at the works erected by me at Bristol they regularly obtain 3500 to 4000 feet from the same quantity *by fully working up the residuum*." In a P.S. it is said, "Some may not understand why I only obtain 2000 feet from each cwt. of resin, while at Bristol 3500 to 4000 feet is produced from the same quantity. This is easily explained. The gas at Southport is 26½ per cent. superior to that of Manchester; by, therefore, merely *adding that additional per centage of my water gas* (and they add still more at Bristol) you have above 3500 feet, equal still to Manchester gas." Here, then, the greater quantity of gas is accounted for, at one time by *working up the residuum*, at another by the *additional*

* I beg distinctly to be understood, in making this remark, that I am not throwing out any reflections against Mr. White, far less against the proprietor of the apparatus, to whom I am indebted for his kind permission to test the quality of the gas. The latter was not aware of the state in which the apparatus was at the time; the former, so far as I know, knew nothing of the proceedings.

per centage of water gas. Hence, from 1 cwt. of resin any quantity of gas may be got, provided an additional supply of water gas be introduced. But, then, as Mr. White properly admits, this acts injuriously on the illuminating power, consequently the less that there is of the water gas the better, in so far as light-giving is concerned. Here again, we have additional proof of what I have already advanced, derived from Mr. White's own statement. He has said that in his process the water costs *nil*. I go still farther, and maintain that the water is *nil*, not only before it goes into the retort, but also (if this word will admit of a comparative degree) that it is worse than *nil* after it escapes from it. Why, then, use it? Merely, I presume, because it *adds to the quantity*, and with some, quantity goes a great way.

Correspondence.

CLAY AND IRON RETORTS.

Sir,—Having in former letters sufficiently adverted to the principal objections urged against clay retorts, I will close this correspondence by a few remarks upon the data and a few minor details obtained by Aluminium Ferrum in his experiments upon 15 cwt. of coal.

I have before me a letter from the manager of the gas work at which Aluminium Ferrum obtained 8000 cubic feet of gas from a ton of caking coals with clay retorts, giving me a detailed account of his workings from December 3, 1848, to April 15, 1849. I submit to you the following extracts:—

"The foregoing gives an average of 8·726 cubic feet of gas per ton of coals, and, reckoning from January 1, 1849, for the first fifteen weeks of this year, gives 8·820 cubic feet per ton of coals."

In another part of the same letter he again adds:—

"I have, in 48 hours working, obtained 9·680 cubic feet per ton, and, in 12 hours working, 9·820 cubic feet per ton."

The clay retorts used in the above case were of the same manufacture as those used by me, with this difference, that the pressure upon the retorts at these works is equal to 6½ inches head of water, but in the other instance there is a pressure equal to 12 inches of water.

I confess I have not much faith in the mode in which Aluminium Ferrum tested the quality of the gas produced from the iron retorts, as compared with that produced from clay ones. My experience has satisfied me that an erroneous opinion of the quality of an illuminating gas may, and does often, occur in judging of it by its specific gravity.

The hydrocarbon gas produced by Mr. Stephen White at Southport is stated to have a specific gravity of upwards of ·760. Yet careful photometric experiments prove that the light-giving qualities of that gas are not in the ratio of its specific gravity, when compared with gas produced from Wigan cannel, having a specific gravity of ·490.

The source of error in the former gas originates in the greater proportion of carbonic oxide which it contains in comparison with the latter, and, as nearly all coal gases contain nitrogen and often carbonic oxide, I question the value of this part of Aluminium Ferrum's experiments.

Notwithstanding the theoretical explanations adduced by that gentleman, as to the real cause of carbonaceous deposit upon the interior surfaces of either clay or iron retorts, I cannot agree with him in the opinion he expresses that the pressure at which either retort may be worked has very little to do with the matter. With him I allow that a retort worked with the same coal, at a high temperature, will have more carbonaceous deposit upon its internal surface, in a given time, than a retort under similar circumstances worked under a lower temperature. But I question whether this view of the case will account for the undermentioned fact.

There are two stations connected with this establishment where gas is produced: at the No. 1 station the pressure upon the interior of the retorts in winter time is equal to a column of water of 6½ inches. At the No. 2 station, with old-constructed apparatus and wet lime purifiers, the pressure was equal to 37 inches column of water.

During twelve months iron retorts were used at both stations. At the termination of four months the deposit of carbon on No. 1 retorts was about ¾ inch thick. At the No. 2 station, during the same period, the deposit upon the retorts was 1½ inch thick. In both cases the same mixture of cannel and coals was used, the retorts worked at as near the same temperature as possible, and the production per ton of coal and cannel approximated very nearly. This apparent anomaly requires some other explanation than that offered by Aluminium Ferrum, and, if he had reason to apologize for the scantiness of the materials which he brought under review, it was at least ungracious of him to express an opinion that the profession is "profoundly ignorant" of the most important operations of gas engineering.

——, *Lancashire, May* 22. Experimentum Crucis.

Legal Intelligence.

SURREY SESSIONS, April 16.

APPEAL.

THE PHŒNIX GAS COMPANY *v.* THE PARISH OF CHRISTCHURCH, SURREY.

This was an appeal by the Phœnix Gas Company against the amount at which they were rated by the parish of Christchurch on the poors-rate made Oct. 25, 1849, for the Midsummer quarter.

Mr. M. Chambers, Q.C., with Mr. Bagley and Mr. Arnould, appeared for the appellants; Solicitors, Messrs. Young, Vallings, and Young: Mr. Collier and Mr. Meymott for the respondents; Solicitor, Mr. Blake.

After a short conversation on a request made by Mr. Collier for an adjournment of the case in the absence of Mr. Bodkin, who had been retained on behalf of the respondents,

Mr. M. Chambers proceeded to open the case in support of the appeal, which he said was one of great importance to the Phœnix Gas Company, as the decision would settle the principle on which they were to be rated in twenty-three parishes, and, if given against them, they might have to pay three or four times as much as they ought if their property were fairly valued. In this case they appealed against the assessment of Oct. 25, by which the appellants were rated at £818 on their gross estimated rental, and at £683 as the rateable value of their gas mains in the respondents' parish. They were surprised and astonished at being so rated, because the previous rateable value of such mains was only taken at £90; accordingly they felt bound to appeal against such an extraordinary and sudden rise. They had alleged several grounds of appeal, but the substantial ground was that they were overrated. The company was incorporated by act of Parliament, and they had, as he had already stated, works and mains in twenty-three parishes on the south side of the river Thames, their mains extending from Clapham to Greenwich, some of the parishes being in Kent and the remainder in Surrey. In the respondents, parish they had no gas works for the manufacture of gas, but simply pipes for the purpose of supplying gas to the parties requiring it in the parish, and to the public lights, as also pipes for the purpose of conveying gas for distribution in other parishes. They had three stations for works for the manufacture of gas; one at Bankside, one at Greenwich, and a third at Vauxhall; they also had two gasholders or reservoir stations, where gas was contained for the purpose of being distributed in other parishes, one being in Wellington-street, St. George's, and the other near the Oval, Kennington. The consumption is occasioned by the public lights and private consumers. They have mains and pipes of various calibres for the purpose of distributing the gas to the consumers, and also for the purpose of conveying it into the different parishes, and one of the important questions which the bench would have to decide would be how the rate was to be imposed with regard to these latter pipes. What he also had to contend was, that the proper way of apportioning the total rent was by the cubic contents, and not by the length or superficial surface occupied by the pipes, or by the amount received for gas sold. He should contend that they were not to be rated according to the length of pipe in the parish, or the superficial area, but that the justest and most proper way was to take the cubical contents, or, in other words, the capacity of the pipes for conveying gas. An appeal had already been tried by the Kent Sessions against the rate made in the parish of Greenwich. In that appeal the Kent Sessions adopted the superficial area.

Mr. Collier objected that in this stage of the inquiry any conclusion come to by the Kent sessions was not material here.

Mr. Chambers said he only mentioned it as a matter of history. He found a work had been published by a gentleman who might be called as a witness on the other side, and he said that the superficial area so adopted was a proper mode of ascertaining the rateable value of the pipes in the parish of Greenwich. The company, being anxious only to be rated on the proper principle, and also according to the actual facts, had adopted this course. They did not shut up their books nor keep back any statement, but they said the just mode of rating was according to their actual expenditure and receipts, according to act of Parliament; it was not on their profits of trade, but on their receipts, after the deductions allowed by act of Parliament, that they contended they ought to be rated. That is, they considered that, looking at what they had done with the land which they occupied, the fair criterion of value, as required by act of Parliament, was what a tenant would give if he were to hire it. The company, therefore, opened their books to the inspection of the respondent parish, so that if there were anything incorrect they might be able to state to the court where they thought the appellants were wrong. He should, therefore, submit to the consideration of the court that there could not be a better, juster, or more equitable plan for any company to adopt than to say, "You shall be made acquainted with the whole of the secrets of the management of our landed property, so that you may satisfy yourselves of the actual value of the whole of our property through all the parishes into which it extends, and of the actual value of the land we occupy in the respondent parish." What was the rule for finding what a tenant would give when he took land for works, whether it were a farm or a manufactory, a spring of water or a mineral spring, or the like? It was this, and the rule was the same in all cases. He apprehended that the first thing the tenant would do would be to say to the holder, "You have been in the occupation of this land for a given period, permit me to see how you have managed it; that is to see your books, that I may be able to consider what rent I can afford to give for it." Without that a tenant would not be able to arrive at any definite idea of what it would be worth his while to give for the premises in question. That was the course adopted in all hiring of land to be used for purposes of trade, whether, as he had said, for farming or for selling water, as a mineral spring like the Cheltenham waters; that was

what a prudent man would do to see what had been done to improve the annual value of the land in the hands of the proprietor, and having so ascertained from the books and by inquiries what had been done, he was then able to judge of what he could afford to give. Accordingly, having laid open their books to the inspection of the opposite party, the company had made their estimate on the actual facts; and not only had they laid open their books, but they had also given them copies of all the papers they meant to produce, so that they might have an opportunity of ascertaining whether there was any defect, omission, or overestimate. The principle on which they had proceeded was according to the strict rule enjoined by the act of Parliament. First of all, they took the net profits, and then made the statutable deductions allowed by the act of Parliament, and that gave them what they considered the rateable value. A gentleman named Lee and another had been employed for that purpose, and he would state exactly the course which had been pursued by them. Mr. Lee was an experienced man, well acquainted with the mode of rating works of various descriptions, such as water-works, and he proceeded on a principle which the court would doubtless acknowledge to be the correct one. First he ascertained the total receipts, from which he deducted the payments; that gave of necessity the net balance of profits; but having done so before arriving at what a tenant would give, they must make certain further deductions. In the first place, as regarded a concern of that description, it was obvious that there must of necessity be a large floating capital, which, like the capital involved in a silversmith's shop, must remain constantly invested, and with regard to which there must be an allowance, or per centage, in order to make it worth a tenant's while to take the property. For that purpose a certain sum had been taken as a floating capital, on which Mr. Lee had allowed a per centage of 5 per cent. as interest. He had then taken 12¼ per cent. as tenant's profits. Now, in some cases as much as 20 per cent. was allowed as tenant's profit, and in manufactures a higher per centage was generally allowed than in farming and other matters. Mr. Lee said 12½ per cent. was a fair allowance for tenant's profits in this case. Then deductions were made for insurance, renewal of buildings, and trade fixtures, works, pipes, &c., and that left the balance at which the works ought to be rated, that is, the stations containing gas manufactories, the stations for gas reservoirs, and the pipes spread over the twenty-three parishes. Having thus arrived at the proper balance on which, if the whole were in one parish, the rates ought to be imposed, the next thing was to divide that amount among the twenty-three parishes, and the course pursued in that respect was to value the whole of the land, buildings, apparatus, and mains, and take the total value, and then to take the value of the pipe; having so done, the next step was a mere rule of three sum: as the total value of the works and pipes is to the total rateable value, so is the value of the works in any parish to the rateable value in that parish. He believed that was the substance of the rule which Mr. Lee had laid down; and having gone through that mode of proceeding, he arrived at the conclusion that, with regard to the rateable value of the pipes in that particular parish, the amount at which the Phœnix Gas Company ought to be rated was £113. In making that calculation, he had had proceeded on the principal of taking the total cubic contents of the mains, and dividing the total rent due to the mains among the different parishes, according to the cubical contents of the mains in each, and also on the principal of not rating according to the receipts in the particular period, because that would be unjust and contrary to all the cases in point, inasmuch as there were pipes laid down in parishes were there was little or nothing yielded by the supply. For instance, in one parish there were pipes and no lights, that is, no earnings; but, nevertheless, where land was occupied and for a beneficial purpose, being occupied for the conveyance of gas through the parish. Undoubtedly that parish was entitled to say that, although the company received no earnings directly from the parish, still the land was occupied beneficially for the purpose of carrying on and contributing to their general earnings. Now that principle was established by the earliest cases. in the New River case, where the spring was at Amwell, whence it was conveyed to London through several parishes, the court decided that the company was not to be rated in the parishes where it got the whole of its receipts; but as the water was conveyed through several parishes, the rating should be divided among all the parishes. Another case in point was that of the Cheltenham mineral spring, where a similar decision had been given. It was a well ascertained principle with regard to water companies that, although they had no receipts in parishes where they occupied land beneficially, yet they were not to be assessed in respect of such land. So with regard to gas works, they were not to rate a gas company according to the receipts in any particular parish. He apprehended, however, that the respondents had proceeded on that false principle when they attempted to rate his clients at £600, because it was true they had a great many pipes in that parish, but a large portion of them only travelled through to other parishes. The only proper principle was that of the cubical contents of the pipes in the parish, and on that principle the company had proceeded. He then cited the case of the Queen against the Cambridge Gas Light Company. In that case there were some places which were not rateable at all, namely, the colleges, which were supplied by the company. The court in that case laid down, as clearly as possible, the principle for which he was contending, that the *quantity* of apparatus used in the particular parish was the proper standard for the amount at which the company should be rated in such parish. The case was in the 8th vol. of Adolphus and Ellis, p. 73:—"The company under an act of Parliament erected in the parish A, in Cambridge, a gas works and other gas apparatus, and laid down mains and pipes in that and other parishes, and also on extra-parochial land belonging to certain colleges in the University. The company supplied light by means of such pipes to the several parishes and colleges, so that the company was rateable as occupiers of land in the different parishes by their apparatus, pipes, &c., and were properly assessed in the sum which a tenant would pay yearly for the apparatus, pipes, &c., deducting the annual average expense of renovating the same, but not the profits of trade, and deducting also the value of the pipes in extra-parochial land, and the resulting amount should be distributed among the parishes, not in proportion to the payment for lights, but according to the quantity of land occupied by the apparatus in each parish." He thought nothing could be more distinct than that, when the court said "according to the quantity," that quantity was not to be ascertained by the length or breadth, but by the cubical contents, or, in other words, their capacity, and if that were so, then they would, from the figures they should show the court, arrive at the conclusion that, instead of being rated at £600, they ought only to be rated at £113. He was aware that a notion was entertained that the decision in the case of the "Queen *v.* the Cambridge Gas Lighting Company" had been broken in upon or altered by a decision respecting a water company; but a water company and a gas company were as different, we might also say, as light and darkness. A water company was established for the purpose of conveying that which was a natural product of the land to a distance, not for the purpose of manufacturing an article in the same way that gas was manufactured. A water company could scarcely be considered at all in the light of a manufacturer; and it was in consequence of that, that the profits derived from a water company were not, strictly speaking, profits of trade; but, on the contrary, were more in the nature of the profits made by a farmer. We sowed the seed in the land, and the land itself thus obtains an improved value by reason of the seed sown. But, suppose water and gas companies were alike; they would find in looking at the case of the "Queen *v.* Mile-end Old Town," decided in April 21, 1847, and which was in the "Law Journal," col. 16, p. 184, "Magistrates Cases," the Court there carefully guarded itself against being supposed to have decided contrary to the principle laid down in the Cambridge case; for they say in delivering their judgment, p. 189, "This apportionment is not at variance with the grounds of the judgment in the 'Queen *v.* the Cambridge Gas Lighting Company.'" There the court decided that the parishes in which profits are received are not entitled to all the amount produced by the rate, but that the parish in which parts of the apparatus indirectly producing the profits are situate, are entitled to a portion. The court also declares that the principle on which the rateable value is to be apportioned, is the same as that of canals and railways. We thus endeavour to show that the rule for the rateable value should be applied so as to distribute among several parishes the rating arising in each. Therefore, this case instead of destroying the Cambridge case supports it, because the court said they did not intend in the slightest degree to interfere with the decision in that case. He had stated the principle on which these proceedings had taken place, and it seemed to him that, as far as the principle was concerned, the only point was with reference to its being intended to rate on the actual receipts in each parish, and also with regard to their saying that the cubical contents was the proper guide for ascertaining the quantity of land beneficially occupied in the particular parish. He believed that in this case, however, there would be very little difference in the result, whether they took one method or the other. He did not suppose that taking the superficial area would cause a difference of more than £10; but he argued that the cubical contents was what was meant in the Cambridge case. That case was a very important one in considering the present question, as it was a case precisely in point, and not simply analogous, and he thought the court would rather look to it than to a waterworks case. He thought it would be found in some of the books on rating, that a manufactory stood on a different footing from a waterworks. Archbold, p. 104, referring to the cases, said:—"Gasworks. Gasworks being erections on land, which render it additionally valuable, are rateable to the poor; but being manufactories, they are not rated in the same way as waterworks, canals, &c." He there cites the case of the Birmingham Gas Light Company, which, he said, "being rated to the poor in a sum equal to the profits appealed, and being incorporated by act of Parliament, and authorized to break up the pavement of the town for the purpose of laying down pipes and to manufacture gas, coke, and tar at their works at Birmingham, and to convey gas by pipes underground to the houses of the inhabitants who used the same; and it also appearing that it was not the custom in Birmingham to rate manufactories according to the profit or stock in trade, the court held that the company had been wrongly rated * * * *; and that the correct amount for which the company was rateable, was the sum for which the buildings and pipes would let to a person willing to carry on the same business." He then referred to the case of the Brighton company which was rated in Brighton parish, but the gas was manufactured at Rottingdean, and thence conveyed to Brighton by pipes underground. The court held that the company were to be deemed occupiers of the land in which their pipes were fixed; therefore they were rightly rated as such according to the value of the land as raised by the pipes being fixed in it. Archbold then gives a summary of the Cambridge case:—"The Cambridge Gas Lighting Company was rated in a sum of £2400, being the sum at which the work would let to a tenant; they were rated at £250 in the parish in which the works themselves were situate, and the remainder was distributed in the ratio of the respective sums received for gas in the several parishes. The mode of rating was by deducting the amount of expenditure from the receipts; from the balance a sum of £500 was to be deducted, which was required to keep the works in repair, £600 as profits in trade, and £350 as the value of the pipes in the colleges, which were extra-parochial and never paid poor-rates. The court held that, taking the whole sum at which the works would let to a tenant was the proper way, and as the works were of a perishable nature, sufficient should be deducted to keep them in repair, but nothing was to be allowed on profits, and as the company was only rated on the pipes which were in the parish, they could not be rated for the pipes in the college." Thus they had three cases in which the rule was clearly laid down: first, that gas companies were not like water companies; secondly, as far as profits

of trade were concerned, they were not a subject for rating; and, thirdly, that the rating was to be according to the quantity of pipes and apparatus laid down in each parish. The Cambridge case was a strong case in favour of the Cambridge Gas Lighting Company, because, with regard to the places which were extra-parochial, they had pipes which did not pay at all. The colleges not being in any parish, if they had two million feet of pipe in the colleges, although they beneficially occupied land, they would not have to pay any thing in respect of such land. Having thus directed the attention of the court to the principle on which they had proceeded, he would briefly advert to a few of the figures at which Mr. Lee had arrived. The items of receipts for the year ending Midsummer 1849, were:—Total rental for lights, £72,498. 17s. 3d.; coke sold, £13,639. 14s. 9d.; ammonia sold, £446. 4s. 2d., making the total receipt £86,584. 1s. 2d. On the other side, the expenditure was:—3927 tons of coals, £29,313. 14s.; tradesmen's bills for repairs and materials supplied, £8,085. 2s. 7d.; meter, repairs, fixing, and depreciation (deducting rent of meters received, £3095. 6s.), £240. 5.; retorts and depreciation, £3060. 16s.; rates and taxes (rent, £1414, is not charged), £2502. 3s. 10d.; salaries of officers (directors' and auditors' salaries, £1021, not being included, as it was wished to put the concern on the same footing as if a man conducted it for himself), £3778. 17s. 4.; wages of men and foremen, £14,629. 9s. 9d.; allowance for bad debts and overcharges, £2336. 6s. 6d.: total outgoings, £63,945. 15s., which, deducted from the gross receipts, left a net profit of £22,641. 1s. 2d. From this sum the statuable deductions must be made in order to arrive at the sum which it would be worth the while of a tenant to give. The first is 5 per cent. on the capital employed by the tenant, that is six months' expenses. There must undoubtedly be an enormous floating capital engaged in carrying on these works, and it is set down at £30,804; present value of meters, £15,000; ditto of retorts, £7331; making a total capital invested in these three items of £53,135. Five per cent. on that sum would give £2656. They then took the amount of tenant's profits at 12½ per cent. on £53,135, which would be £6642. That made the total of interest and tenant's profits, £9298, which being deducted from the net balance left a gross estimated rental of £13,343. There were, however, other statutable deductions to be made before they could arrive at the rateable value: there were insurance, £162; and 2 per cent. on cost for renewal or reproduction of trade, fixtures, utensils, mains, &c., £3292. These being deducted, there was left as the net rateable value, £9889. 1s. 2d. Mr. Lee then went on to value the stations, including land, buildings, and apparatus at Bankside, Wellington-street, Greenwich, Vauxhall, and Kennington, for which he puts down £170,386; to which being added the value of all the street mains laid, viz., £105,760, the total saleable value of the stations and mains is found to be £276,146. The next step is to find the quantity of street mains in Christchurch, and also the total quantity of mains. There are respectively 155 cubic yards in Christchurch, and 5229 cubic yards the total quantity. The process was now reduced to a simple Rule of Three sum:—If £276,146, the value of all the property, gave £9889 as the net rateable value of all the property, what would £170,386, the value of all the gas stations, give? Answer—£6101. From that it was easily deduced that the net rateable value of the mains was £3778. To obtain the net rateable value of the mains in Christchurch only, they must put it thus:—If 5229 cubic yards, the total quantity of street mains, gave £3778, what would 155 yards, the quantity in Christchurch, give? Answer—£113. That was the course adopted by Mr. Lee. He understood, however, that a different principle was to be put forward by the other side through the mouth of Mr. Penfold, a gentleman who had given great attention to the subject, and who had written a pamphlet in which Mr. Lee's principle was contradicted. In that a new theory was put forward as regarded the rating of companies, and, indeed, all persons who occupied land beneficially, in which a highly speculative and imaginary production was pitted against actual practical experience; and a supposition was made as to what might be done if a person had an enormous capital to invest suddenly in taking a gas works, and that the probable result of what he might do should be looked at in fixing the rate, and not the actual results. They said, "You can fill a retort a given number of times in the course of the day with a given quantity of coals, and thereby produce a given quantity of gas." Then there was the theory that there ought to be no waste either in the manufacture or distribution of gas, and that a given quantity of gas could be manufactured according to the capacity of the retort, and, therefore, the party ought to be rated according to that quantity, as if the retorts were always perfectly clean, as if the pipes were always perfectly sound, and as if there were no escape. He submitted that that theory was entirely wrong, and that the only correct principle of ascertaining the amount a tenant would pay was the one Mr. Lee had adopted. On the grounds he had stated he asked the court to reduce the rate to £113.

All the notices, &c., were admitted on both sides.

The first witness called was *James Samuel Burslem*, clerk in the service of the company. In answer to questions from Mr. Bagley, he stated that he had been employed to go through the accounts of the company for the year ending Midsummer, 1849, and had made abstracts of certain amounts which he produced and identified. There were the trade account, the tradesman's bill account, an account showing the number of burners in Christchurch parish and the rental received, distinguishing public and private lights; an account of the stock of meters, and an account of depreciation and expenditure of ditto. He also verified the results as stated by Mr. Chambers.

Cross-examined by Mr. Collier.—Had made the trade account from the ledger, the journal, the stock-book, the rental ledger, and the balance ledger. Referred to the journal containing the gross receipt for the quarter ending Christmas, 1849, folio 88; found an entry, "rates and taxes, £1080. 0s. 5d." That entry was written on an erasure. Could not account for such erasure. Found entries similarly written on erasures in the journal of 1848, folios 630, 632, 671.

Re-examined by Mr. Chambers.—Merely made extracts from these books, and was, therefore, unable to explain the erasures.

The witness was examined at some length by Mr. Collier with regard to the various erasures, but was unable to give any account of them.

Mr. William Innes, assistant engineer to the company, was then called. He produced accounts showing the quantity of coal consumed at the various stations down to Midsummer, 1849. It amounted to 39,068 tons for the year. The quantity of gas manufactured from that was 352,322,000 cubic feet. The rental for the quantity supplied was £72,498. 17s. 3d. The price to private consumers was 6s. per thousand, and to the public burners about 4s. The amount of leakage was 22·9 per cent., 77·1 per cent. of gas being actually burned. The amount of leakage was ascertained by deducting the quantity consumed as shown by the meters from the quantity measured into the reservoirs before distribution commenced. The quantity consumed by the public lamps was ascertained by fixing meters to several, and taking an average of the results. Allowance was also made for the quantity consumed at the several stations of the company. He accounted for the large amount of leakage by the number of main pipes used to convey the gas to the consumers. The whole quantity of main pipes was upwards of 440,000 lineal yards, or about 250 miles. The ground in which they were laid was very frequently disturbed for sewerage and drainage purposes, and the pipes were considerably injured by the consolidation of the ground after being removed, and thus a large amount of extra leakage was occasioned. That was more generally the case in the metropolitan parishes than elsewhere in outlying parishes. The frequent passage of heavy vehicles will also cause a larger amount of loss in metropolitan parishes. The gas in its passage from the station to the reservoir was measured at the station meter. It entered the station meter at a temperature of 58 deg. It cooled in the station meter, which would cause a diminution of quantity, and a deposition of its better qualities. That would be termed a loss. There were three stations for the manufacture of gas: one at Bankside, one at Greenwich, and one at Vauxhall. There were also two separate stations for holding gas alone: one in Wellington-street, in St. George's parish, and one near the Oval in Kennington. No gas was manufactured at either of those stations; they were merely reservoirs for holding gas. The pipes of the company extended over twenty-three parishes. The amount of gas supplied was very unequal in all those parishes. Some of the pipes extended to a distance of nearly nine miles from the works. The greatest distance was to the extreme end of Lower Tooting, in the Mitcham road. The proportion of apparatus or quantity of mains and pipe in each parish was scarcely a criterion to determine the consumption. In one parish, St. Nicholas, Deptford, they had a great many pipes and no consumption. In the adjoining parish of St. Paul there was also a large quantity of mains and very little consumption. The pipes in those parishes were large conducting mains which passed through without supplying any gas in the parish. There were other parishes in which they had a number of mains and very little custom. The quantity of coals carbonized at all the stations in the year ending Midsummer, 1849, was 39,068 tons. The greatest number of retorts in use during that time was 591; that was at Christmas, when they always made a much larger quantity of gas. The average number of retorts in use for the whole year was 448. They had nearly double the number of retorts available for use. The amount of gas made depended on the demand. The retorts were "charged," that is, the coal was put in four times in 24 hours. The average weight of coal carbonized in each retort in the 24 hours was nearly 6 cwt., or 1½ cwt. to each charge. The retorts were all iron. A large deposition of carbon took place in the inside of the retort during the process of carbonizing the coal, so that, after being in use some time, an old retort would be incapable of taking so large a charge as a new one, owing to the incrustation on the inside. The average quantity of gas made at their works from a ton of coal was nine thousand cubic feet. If a larger quantity were made, the quality would be considerably deteriorated. If the quantity were carried to ten thousand cubic feet instead of nine, the difference of light would be about four candles, that is, seven candles instead of eleven. Had an account of the cost of mains and pipes in each parish. [It was agreed to accept the accounts].

Cross-examined by Mr. Collier:—There was a large main running from the manufactory at Bankside to the reservoir in Wellington-street, St. George's, which supplied the reservoir with gas, and without which the reservoir would be entirely useless. The greater part of that main ran through Christchurch parish. There was more than one main for lighting that parish; almost every street had a main. All pipes of 2 inches and upwards in the bore, and of cast iron, were termed mains. Could not tell the number of separate mains in the parish, but knew the length and various sizes. In addition to those mains which supplied Christchurch, there were two mains which carried on gas to parishes beyond. Christchurch itself was so contracted, that a main for supplying that parish alone would be of very small dimensions. Mains from the works at Bankside passed through the adjacent parishes into Lambeth. One main passed through a corner of Christchurch parish into Lambeth and Kennington. It was a 12-inch main from the reservoir in Wellington-street, which passed through about fifty yards of Christchurch parish from the boundary at the corner of Charlotte-street to John-street. That was the only large main which passed through the parish without supplying it. There were a number of small mains which supplied that and other parishes as well. With regard to leakage, Christchurch was one of the worst parishes they had; Bermondsey and St. Savicur's were, perhaps, worse, owing to the number of service pipes, and the frequent alterations of the roadways. Within a short period they had been obliged to lay a new main in consequence of the digging up in Bermondsey. They lost a great deal of gas in Gravel-lane from the frequent digging

up of the soil. They are dug up quite as frequently in St. Saviour's as in the Strand or Fleet-street. It was a very material thing to a gas company to diminish leakage. A great deal of course depended on the laying down of the pipes, but that was not very material in an old parish like Christchurch where the mains and services had been laid down ever since the company had been in existence.

The court then adjourned until the next morning.

APRIL 20.

At the meeting of the court to day, Mr. MEYMOTT applied for an adjournment of the case, Mr. COLLIER being unable to attend in consequence of illness, and Mr. BODKIN having returned his brief. After some conversation, it was agreed that the case should be postponed until the adjourned session-day, May 27, when it should be taken peremptorily.

MAY 31.

The hearing of this appeal was resumed to-day before Mr. Puckle, Chairman, and a bench of magistrates. Mr. M. CHAMBERS and Mr. ARNOLD appeared for the appellants, and Mr. BODKIN for the respondents.

Mr. Innes, assistant engineer to the company, recalled, and examined by Mr. BODKIN.—Had gone through the accounts produced with the books of the company. Was not aware that when this rate was about to be made the company were advised not to produce their accounts. Would hesitate to speak as to the accuracy of the items in the statement of the company's receipts and expenditure, as he had not been engaged in the preliminary making up.

Mr. J. S. Burslem was also recalled, and cross-examined by Mr. BODKIN.—Had prepared the accounts given in. The amount put down under the head of receipts was not exactly correct, as a portion of the cash put down as receipts in the year ending Midsummer, 1849, was not actually paid in until the succeeding quarter. Credit was taken for that portion, as, although not immediately paid, it was due for gas charged in the preceding half-year. Took the amount of £72,498 from the rental book. It was the amount of the charge made to the consumers. Could not say the amount actually received in cash during the year. The rents for gas and meters were collected quarterly. The sum of £13,639 put down for coke was for the amount actually made, being more than that actually paid for, as it included a valuation of stock in hand. It was the same with regard to the ammonia.

Mr. CHAMBERS, for the appellants, objected that Mr. Bodkin was reopening the case.

The CHAIRMAN said the understanding was that the case should be considered as part heard; and, after some conversation, he suggested that Mr. BODKIN should confine himself to questions that had not been put on the former day.

Cross-examination continued.—The £72,498 represented the debit to the customers merely, and not the cash actually received in the year. Did not know how much of that sum was received. The item of £29,000 for coals, in the expenditure, excluded a stock on hand to the value of £3405. The stock on hand at Midsummer, 1848, included, was £4058. The item of "tradesmen's bills," comprising paving, tubing, castings, iron and steel, valves, and gas fittings, included charges for laying on gas to new customers.

By Mr. CHAMBERS.—It was not entirely for new customers. Some of the charges were——

By Mr. BODKIN.—The expenses for laying on gas to new customers were included. There were charges for insurance and water rates, included under "tradesmen's bills." They were actually paid by the company. The amounts for retorts and depreciation of retorts, and for rent, rates, and taxes, were also paid by the company. "Salaries" was for all the people employed in the affairs of the company. It did not include workmen's wages. There was not a separate staff of clerk, &c., for the affairs of a company as a company, that is, as between the shareholders and the directors, and another for the affairs of the company, as between the consumers and the shareholders. The staff was employed on both duties without distinction. Could not say how much time was occupied by the one duty and by the other. Perhaps one-third of their time was occupied in keeping the accounts of the company as between the shareholders and the directors. Declined to speak positively on the subject. The item of £14,000 for wages included the expense of laying on gas to the new consumers. Had no idea what portion of that sum was applicable to that purpose.

By Mr. CHAMBERS.—Had extracted the figures in the statement from the company's books, but did not keep those books himself. Had found the charges for paving, tubing, &c., by reference to the invoices. When he said they were attributable to laying on gas to new customers, had merely judged so. The entries of repairs for old customers were included in those charges. With regard to the item of salaries, there were a number of clerks engaged at the stations at Bankside, Greenwich, and Vauxhall, besides a number of outdoor clerks to collect money. Did not know of any duties which those clerks would not have to perform, if the works were carried on by one man instead of by a company. The cashier was the person employed to keep the accounts between the directors and the shareholders. He was the only person so employed. Had no idea what portion of his time was occupied in keeping the accounts as between the directors and shareholders and the general accounts. When he said that one-third of the time of the staff was employed in keeping the accounts of the company as between the directors and shareholders, he did not understand the question.

Mr. James Dixon called, and examined by Mr. CHAMBERS.—Is a coal-factor carrying on business in the Coal Exchange. Is acquainted with the coal trade. The price paid by the Phœnix Gas Company for their coal averaged 14s. 6d. per ton, delivered at the stores. That is a very fair price. It is the very lowest price at which they could have purchased the coals.

Cross-examined by Mr. BODKIN.—The trade terms are prompt payment in cash on each delivery weekly. Thirty days' interest, at 4 per cent. per annum, is allowed for prompt payment. The 14s. 6d. is after making that allowance. The discount would not be a penny per ton. The company buy their coals in the North at a contract price, and make a contract with the shipowner for the freight. Had made the calculation that the coals would stand the company in 14s. 6d. a ton. The amount is paid on the delivery of the coals in London. He received the money for the coal owners, and either paid it to their order in London or they drew on him. It was the best way to buy the coals at the pit's mouth and bring them up to London.

Mr. Lee was then called, and examined by Mr. CHAMBERS.—Is an architect and surveyor. Had been largely engaged in the valuation of parishes for rating. Had rated five large parishes altogether, besides being engaged for other parishes. Had valued Battersea, Wandsworth, Putney, Wimbledon, St. James (Westminster), and Lambeth. Is now parish surveyor to four parishes. Had surveyed and valued the lands, buildings, and mains belonging to the Phœnix Gas Company, with a view of ascertaining how they ought to be rated. Had made out a valuation and calculation from returns furnished to him by the company:—

Net balance of profit for twelve months						£22,641	1	2
Deductions to arrive at the gross estimated rental:—								
Five per cent. on the capital employed by the tenant, viz., in six months' expenses	£30,804	0	0					
Do. on present value of the meters, the cost being £22,560	15,000	0	0					
Do. on the present value of the retorts	7,731	0	0					
Amount of tenants' capital ...	£53,135	0	0					
Five per cent. on the above is ...				£2,656	0	0		
Amount of tenants' profits, being 12¼ per cent. on £53,135, the capital required, is				6,642	0	0		
Amount of interest and tenants' profit for twelve months						£9,998	0	0
The gross estimated rental of the whole property						£13,343	1	2
Statuteable Deductions:—								
The rates and taxes are previously deducted.								
Insurance on buildings				£162	0	0		
The annual repairs of buildings are previously deducted.								
For renewal or reproducing 2 per cent. on the following, viz.:—								
Trade Fixtures	£39,673	0	0					
Utensils	12,945	0	0					
Mains on the stations	6,271	0	0					
Street mains	105,760	0	0					
Total value	£164,648	0	0					
Two per cent. on this is				3,292	0	0		
Total of insurance and renewal						£5,464	0	0
Net rateable value of the whole property						£9,889	1	2
Total saleable value of all the stations						£170,386	0	0
Do. of all the street mains laid						105,760	0	0
Total saleable value of all stations and mains						£276,146	0	0
Quantity of Street Mains:—								
In Christchurch parish there are 9160 yards lineal of mains, various sizes, the contents being in cubic yards								155
In all the other parishes there are 431,814 yards lineal of mains, various sizes, the contents being in cubic yards								5074
Total cubic yards of street mains in all the parishes								5229

To divide the net rateable value of all the stations from the net rateable value of all the mains:—

If £276,146 (the value of all the property) give £9889 as the net rateable value of all the property, what will £170,386 (the value of all the stations) give?—Answer, £6101.

Net rateable value of all the stations	£6,101		
Do. of all the mains	3,788		
Net rateable value of the whole	£9,889		

To obtain the net rateable value of the street mains in Christchurch parish only:—

If 5229 cubic yards (the total quantity of street mains) give £3788 as the net rateable value of the whole of the mains, what will 155 cubic yards (the quantity of mains in Christchurch parish) give?—Answer, £113.

Cross-examined by Mr. BODKIN.—The size of the pipes which convey gas into the consumers' houses varies from 1½ inch bore to ¾ inch. The ordinary size is an inch. His calculation did not include pipes of less bore than 1¼ inch. He had included in his calculation of £6101 for stations, the connecting main passing through the parish of Christchurch, between the station in Bankside and the large reservoirs in Wellington-street. It is 14 inches bore, and the part passing through Christchurch is 545 yards in length. The value and cost of laying down would be about 22s. 6d. a yard. It weighs 307 lbs. a yard, and the cost would be 6s. 6d. a cwt. It would cost 3s. 6d. a yard for laying down.

By the CHAIRMAN.—He considered £9889 to be the value of this property, including buildings, machinery, and all fixed apparatus, if the company wished to let it to an individual or another company, and that a company would give that sum for the property to carry it on as a gas works. Had made certain deductions in his statement, on account of this being a company.

By Mr. CHAMBERS.—When speaking of 1¼ inch pipes, he meant mains. That is the lowest size of the main. The diameter of the supply pipes attached to the burners depended on the number of the burners. They varied from 1½ to ¾ inch.

Mr. CHAMBERS: That is our case.

Mr. ARNOULD then summed up for the appellants.

Mr. BODKIN replied on behalf of the parish. He said they were all agreed that the sum they were here endeavouring to discover is, what a tenant would give to occupy these works and carry on the trade, and to provide for such expenses as the law permits to be charged against the tenant's rent. The principle, therefore, is very clear; and there would be no great difficulty if the whole of the works

were situated in one parish, but as they extend over several, that created considerable difficulty, as the court would have to decide not only on some matters of fact, but also some questions of law, one of which is undoubtedly so difficult, that the day before yesterday the Court of Queen's Bench took time to consider as to which of the decisions, that in the Cambridge case or that in the Mile-end case, they should uphold in its integrity. He apprehended, however, that he should discharge his duty best, and at the same time convey to them the impression he desired with regard to the law of the case, if he went through the statement made on the opposite side before he adverted to the points of law which would successively arise. The rate made in this case by the parish he represented, was made under circumstances of considerable difficulty; for it was well known a gas work could not be rated like a house or land, which always had a certain marketable value, but they were obliged to look to the concern as a trading concern, in order to find out what a tenant would give; and as the parish did not have the accounts of the company before it, they were obliged to call in the assistance of the company itself, in order to arrive at a mode of ascertaining the value, and on that value was the assessment now before them made. Under these circumstances he did not think the parish had betrayed any intention of making a large assessment for the company to cut down. Here was a company having a large capital of some four or five hundred thousand pounds in this concern; and if they started with the assumption that £9000 was the sum at which those works ought to be assessed to the poor, in the absence of the accounts of the company, he thought it was not unreasonable on the part of the parish officers, who, not having a true basis of calculation, had had recourse to other tests, one of which was to ascertain the cost of the works, and assume that 5 or 6 per cent. might be taken as the return for which a company might be expected to embark its capital. Applying this rule, they would have some very large sum as the probable result of such a mode of calculation. The company had, however, now put forward their accounts, and he would agree with Mr. Chambers, that when a company did that, they should be supposed to put forward that which was the most satisfactory. He should, therefore, address himself to the accounts as laid before them, and his case would be founded on the mode in which this court was called on to deal with the facts in that statement; and he must say that when he arrived at some items about which questions were asked, and asked them to vary or alter those items, he would do so with the greatest confidence, because, with regard to anything bearing on that statement which was left by the company in a state of doubt or ambiguity, he should ask that every inference might be drawn against the correctness of those items. Never had it been his lot to see a case of this kind proved in the slender, shadowy, unsatisfactory way in which this had been done. From the questions which he had put to the witness Burslem, it must be quite obvious that either the cashier, the superintendent, or other such persons, would have been the most proper to have called to prove these accounts. He did not say the company had brought a falsified account, but he did say that they had erred in the mode of stating them. Their statement was fallacious, looking at it with regard to the purpose for which it had been prepared. They first charged themselves with their receipts, making £86,000 as the total. Now he understood that, in point of fact, it was not correct to call them receipts—at least, with regard to the first item—as it was rather debts incurred to the company in that period; and, besides, they afterwards claim a sum for short comings, which should be taken out of the £72,000. They say, however, that their revenue for the purpose of this enquiry is £86,000. Now, they formed a very singular debtor and creditor statement with regard to meters. There was a rent received for meters of £3095., and which, therefore, formed a part of their revenue for the year. They should, therefore, add that £3085 to the £86,000 and that would make their total revenue £89,678 instead of £86,583. Next, with regard to the expenditure; and first, as to coals. The company gave them the quantity in tons, and said it amounted to £29,000. Their own witness, however, proved that the proper price was 14s. 6d. a ton, which, on the quantity stated, he found to amount to only £28,313. The next item was "tradesmen's bills for repairs and materials, £8085." They gave the details of that item, and among them there were:—"Tubing, £747;" "paving, £479;" "castings, £234;" "iron and steel, £269;" "valves and gas fittings, £160." Now, these several sums seemed to him to be clearly referable to the extension of the gas to different customers as the trade increased, and were, therefore, additions to their capital, and could not form an element of deduction in an annual statement of profit and loss. And here he had to complain of the unsatisfactory manner in which these details were put before them; there must be persons in the company's employ who were capable of saying whether these items were applicable or not; but, instead of bringing them, they put forward a witness who was only an under clerk, and who left the matter in a state of the greatest possible ambiguity. Under these circumstances, as the company had not brought forward persons who were capable of giving satisfactory information, he should ask the court to consider that these items were not satisfactorily proved. As in such a case as this, the parish was completely in the hands of the company, from whom alone they could obtain the information necessary to prove their case, he asked the court, in deciding between the parties, to say that the information given ought to be open to no doubtful interpretation. On this ground he should ask the court to disallow these items. In a future stage of this enquiry they would find that a deduction was claimed for insurance, and also a sum for rates and taxes, which the witness stated included all the taxes and rates paid. Therefore, these items, which were very oddly classed among tradesmen's bills, must be taken out of the account, namely: "insurance, £106; water, £90; water-rate, subscriptions, and pensions, £150;" making, with the items before alluded to, a sum of £2235; which he contended ought to be struck off the item of "tradesmen's bills," reducing it to £5850, which he said should be the amount of the second item of expenditure. Passing over the items of "retorts, &c.," and "rent, &c.," to which he made no objection, he came to "salaries, £3778." Now, his learned friend, Mr. Chambers, would remember, that in a recent case of a cemetery company, where a claim was made for what were called establishment charges for clerks, a part of whose duty it was to attend to the business of the cemetery, and a part to attend to the accounts of the company as a company, which would not arise if the affair were carried on by an individual, the Court of Queen's Bench struck off the amount as not to be allowed for establishment charges. Although Mr. Burslem said a great many things, he had not departed from what he first said, that these clerks were employed in both duties, and that one third of their time was occupied in attending to the affairs of the company as a company. He had said there was a cashier who attended to that duty solely; but it was absurd to suppose that one man could do all that work, and the clerks in the office must be employed. He, therefore, took the liberty of charging one-third of the staff for establishment charges, and leaving two-thirds. That left £2496 which ought to stand there. They then came to a very important item, namely, £14,626 for wages. Now it was not pretended—for that account exhausted all the receipts of the company—that any wages are charged to, or paid out of any other account. That sum, therefore, obviously included the wages of persons employed in laying down the extended works to new customers, or in new neighbourhoods, and that on this ground he submitted that that item ought to be considered as extended capital. In fact, it actually went to raising the rating of the company instead of diminishing it. Besides, these works when put down last many years, and it was absurd to charge them as an item of annual expenditure.

Mr. CHAMBERS objected to such an argument. Mr. Innes had made a distinction between plant wages and wages for carrying on the works.

Mr. Innes was here recalled, and examined by the CHAIRMAN.—He stated that the £14,626 was only ordinary wages, and were exclusive of all wages for extension of the works. It included wages paid for laying down service pipes to new tenants to the extent of 25 feet from the main. That was not called plant. He should reckon that about £364 a year might be assigned to that description of labour out of the £14,000. Could not say how much of that was for new customers.

Mr. BODKIN, in continuation, argued that additional pipes to old customers must be considered as an extension of works. He would leave it to the court to say what amount of deduction should be made from this item on account of extension of works. He considered it an extraordinary circumstance that, in the list of pipes, all the pipes which conveyed gas from the mains in the streets to the houses of the customers were entirely left out. The lowest size given was 1½ inch, whilst 1¼ to ¾ inch were the sizes of the pipes which the company, like a water company, had to lay down from the mains in the street to the front wall of the customers' houses. As far as these service pipes were concerned, they did not form an element of these calculations at all, and they were left without the means of making that very large addition to this item. They were told that 25 feet was the average length, and as there must be a considerable number of houses to which gas was supplied, he would leave it to the court to say how they should be dealt with.

Mr. Lee recalled.—The omission would make no difference, as the service pipes were left out of the calculation as regarded all the other parishes as well, and thus the average would not be affected.

Mr. Innes recalled.—The service pipes are not included in the calculation. They are not all the property of the company. Many tenants have their own service pipes, and especially many public institutions. That was particularly the case in Christchurch parish. It was formerly the custom that the service pipes were all paid for by the tenant.

Mr. BODKIN continued.—The last item was for bad debts and overcharges. To that we made no objection. He had now made the total expenditure, £54,304, which, deducted from £89,678 which he had made the receipts, left a balance of £35,374. He had now arrived—subject to such control as the court might think fit to exercise—at the first stage of that inquiry, that is the difference between the actual receipts and the actual expenditure of the company, which was the first thing that a tenant would look to in order to find what he might give. Here was a concern with a gross profit of £35,374; and the next step was to ascertain what proportion of that sum a tenant could afford to pay as rent. The way in which that was put before them by the other side, without any evidence except that of Mr. Lee, who put in an arrangement of figures, was only an assumption that certain liabilities would be requisite to enable a tenant to carry on such a business. He thought it was a mere matter of opinion which would be entirely a question for the court. In the first place, it was said that a man embarking in such a concern would require a floating capital equal to six months' expenditure, that is, £30,804. They also said he would require the value of the meters, £15,000, and of the retorts, £7331, making a total capital required to carry on the concern, of £53,135. Was ever anything so preposterous as that a concern where the returns were quick, the rents being received quarterly, and three months' credit given for the materials, if required, would require such a capital! Nobody who ever carried on a gas works had been called to say whether it was correct or not. He contended that the only capital required was what he would have to pay ready money for during a period of three months, because, at the end of the first quarter, he would begin to receive his returns. But there was a fallacy in making these calculations at all, because, in assessing these works for 1848-9, they were not to suppose that the man had commenced to carry on that concern for the first time. They must take the matter as it actually stood, the company then carrying on the works. But, even if it were not so, he contended that the tenant would only require one quarter's capital. With regard to meters, he had already stated, that the reason why he included the rent of meters as part of the rateable value, was that they were as much liable to rating as the mains or works. That had been decided in the case of the

Birmingham Gas Company, Adolphus and Ellis, p. 634. A man could not be called on to purchase the meters in hiring a gas work any more than he would be asked to buy the mains. He would pay for them all in the rent: so also with regard to the retorts, account would be taken at the time of letting of the number and state of the meters and retorts, and in quitting his tenures he would be required to put them in the same state of efficiency, therefore, those two items of £15,000 and £7000 must also be taken off, and that left the sole cash balance for the tenant, on the most liberal computation, £20,000. Taking 5 per cent. on that, would be £1000. They then came to the question of tenant's profits; the company put it at 12½ per cent. on this supposed necessary capital; but as he had reduced that to £20,000, such a mode of arriving at tenant's profits was wholly inapplicable, nor did he think that a per centage on the capital supposed to be embarked in such a concern would furnish any criterion of what a tenant would be satisfied with. The amount of capital required was no test of the profit derived from a concern, as he could imagine a case where the capital might be very small and the profits large. They must look rather to the nature of the risk, and the degree of skill and anxiety called for by the work. That seemed to him the proper mode, and in that view he had assumed a round sum as profit, and put it down at £5000 a year, which he thought an abundant profit for a concern free from risk, and requiring only the amount he had put down to carry it on, that would leave £30,374 as the sum which he said a tenant would give in the shape of rent. He had now arrived at the termination of the second stage of the inquiry. A tenant in this state of things would give £30,373 instead of £13,000, which the other side by their exhaustive process had arrived at; from that sum, however, they claimed further deductions. Passing over "insurance," which he would let remain, he next came to "renovations." They put down the value of trade fixtures, &c. at £164,648, on which they allowed 2 per cent., or £3292, which reduced their amount to £9889. He would afterwards have to submit to them that in law they were not entitled to that deduction at all. He should pass over the item of trade fixtures and utensils. Now, with regard to mains, they had been laid down only half a century, and they had not heard that they had suffered any perceptible depreciation; he, therefore, thought that 1 per cent. sufficient, which was allowing that at the end of one hundred years these solid iron mains would disappear altogether, and in doing that, they were allowing much too large a sum, as compound interest was going on all the while on the sum allowed; and, therefore, the company would get the full value in much less than a hundred years. However, he was content to allow 1 per cent., namely, £1120; there was, therefore, £2334 to be deducted from the £30,373, which would leave £28,039 as the rateable value. He would now proceed to state to them the proceeds on which it appeared to him that the company were not entitled to make any such deduction at all; there had been several cases—the Grand Junction for one—in which this point of renovations being sent up to the Queen's Bench, and not being challenged, it seemed a matter to be allowed. But in the Great Western case (in the Queen's Bench reports) this point was brought distinctly under the jurisdiction of the court. That company deducted in a rating the amount necessary to keep up the permanent way. The claim came under the consideration of the Queen's Bench, and it was then distinctly put before them under circumstances similar to this, because it appeared there that in the act of Parliament, which authorized the carrying on of the works, there was a clause preventing the directors from declaring a dividend which should in any way impair or lessen their dividend; and in the act of Parliament regulating the Phœnix Company, he found a similar clause—the 31st—which provided "that no dividend should be made whereby the capital of the said company should be in any way reduced or impaired." The facts of that case were that the company divided all their profits in the way of dividend, and did not lay by any amount to provide for renovation. Their claim was therefore hypothetical; they saying that whether they put by, or choose to run the risk, did not affect the claim. They pressed on the court several cases where that item was passed without notice. Lord Denman, in giving judgment, said that, if a sum had been actually set apart from the revenue annually, then it would be allowed; but, if such a sum were not annually set apart, then it could not be allowed. In another case, the Brighton case, which was still undecided in the Queen's Bench, it was argued that a sum ought to be allowed for renovations whether set apart or not.

The CHAIRMAN: I think that is the common sense view of the case; an allowance should be made whether paid for annually or not.

Mr. BODKIN might, perhaps, agree in that opinion; but he was now only stating what the law actually was, without saying whether it was in accordance with common sense or not. They had now arrived at a sum of £28,000 or £30,000, as the rateable value of this concern. He then came to what in this case was a question of considerable difficulty, the works of the company running through a number of parishes. This was the proportion of that rateable value which ought to be allotted to the several parishes. The sum to be divided, after deducting £5068, the value of the stations, at which the parishes actually rated them, was £22,972 in one case, or £25,000 in the other. He believed it would be found, on a calculation of the figures given them, that if the company's mode of distributing this sum was to be taken, that is, according to the capacity of the mains, the parish would be entitled to 3 per cent. on the amount left to be distributed: that is, by comparing the capacity of the mains and pipes in the parish; but if his principle of distribution with regard to the money received for the supply of gas in the several parishes, their proportion would be 5 per cent. That was now the difference between them. The one mode gave them 3 per cent. and the other 5 per cent.; but whether the court took 3 or 5 per cent., the result would support the particular rating in this case. The actual rate was £682; now 5 per cent. on £25,000 would be £1250, and 3 per cent. would be £750. The learned gentleman then referred to the cases of the Cambridge Company and the Mile-end Old-town Company in support of his argument: that the proper criterion according to which a residue of value ought to be divided, was the amount of receipts in such parish, and not the amount of machinery. He concluded, by leaving the case in the hands of the court on the two points of the figures and the principle of rating.

One of the magistrates inquired whether it was admitted that the gas and meter rents were collected quarterly; which question was replied to in the affirmative.

The court then retired to consider its judgment, and was absent nearly two hours. On its return

The CHAIRMAN said, we have given our best attention to this case and have gone through all the figures, and we come to this conclusion, that we must disallow some of the deductions made on the part of the gas company, and that will bring up the total rateable value to £16,089, instead of £9889, as stated by the company. That is our decision with regard to the figures. With regard to the principle of division, we think it would be very inconvenient to base it on gas rental, and we have therefore gone on the principle of capacity for distribution. On this principle we find that the rate should be £326. 13s. 9d., instead of £682, and we therefore decide that the rate book should be amended from £682 to £326. 13s. 9d.

Mr. BODKIN.—Have you allowed them for renovations?

The CHAIRMAN: Yes; we admit the principle, but not exactly the amount. We have made a distinction between the two first items and the two last. We allow two per cent. on trade, fixtures, and utensils, and one and a half per cent. on mains.

Mr. BODKIN.—What sum do you take off for the valuation of stations? The company say that they amount to £6101, but they are only rated at £5068.

The CHAIRMAN: We have taken the amount at which they are actually assessed. We do not add anything for the connecting main, between Bankside and Wellington-street, as that is allowed for in the measurement of capacity. The bench will grant a case to the Queen's Bench on the legal points at the request of either party.

COURT OF EXCHEQUER, MAY 28.

(Sittings in Middlesex at Nisi Prius, in Trinity Term, before Mr. Baron PARKE *and Common Juries.)*

LONGMEID V. HOLLIDAY.

Mr. MILLER and Mr. R. B. MILLER conducted the case for the plaintiff; and Mr. W. H. WATSON appeared for the defendant.

This was an action by which the plaintiff sought to recover compensation in damages for injuries sustained by himself and his wife by means of the bursting of a lamp, which the defendant had sold to them under the implied warranty of safety.

It appeared from the statement of the learned counsel that the plaintiff is himself a journeyman tailor in the employ of the Messrs. Stulz, but that having a large family he had made arrangements to appropriate the lower portion of the house in which he resided, in Gray's-inn-lane, to the purposes of a coffee and chop house, over which his wife was to have the superintendence during his necessary absence at his tailoring labours. In the course of his arrangements the question arose as to the best and the most economical mode by which his coffee rooms could be lighted, and thereupon he made inquiries, which resulted in his wife purchasing a lamp of the defendant under the stipulations and promises which the following handbill had put forth:—

"That it was a self-generating gas-lamp, producing a light of surpassing power and brilliancy, which for economy has never yet been equalled; . . . producing a light superior to 12 mould candles . . . at the small expense of one halfpenny per hour . . . and is also perfectly free from danger."

Now, here the defendant had announced himself as a mineral spirit manufacturer, and the inventor or patentee of this particular lamp at Huddersfield in Yorkshire, but also having establishments at Manchester, Sheffield, and Huddersfield, and on Holborn-hill, London. It was to this last-named depository, of course, that the plaintiff's wife had gone to procure the lamp which combined in itself all the extraordinary properties which the above announcement had intimated. First, it was to diffuse the light of 12 candles, and then it was to be free from danger, and then it was to be excessively cheap and economical; and yet, notwithstanding all these promised qualifications and attractions, it had happened that as the lamp which Mrs. Longmeid had purchased was being fixed it had burst or exploded, and burnt her in a most dreadful manner—so much so, that after suffering great agony, it had been found necessary eventually to send her to St. Bartholomew's Hospital. Whilst she was at that admirable institution, "lumps of flesh" came from one of her arms, and even now, although very considerably better, she was in a lamentable state generally, whilst the sinews of one of her arms were greatly contracted. It was for these results, these injuries, in addition to the loss of his domestic comforts and the vast medical expenses he had been put to, notwithstanding Mrs. Longmeid had in the end been sent to the hospital, that the plaintiff now appealed to a jury for such compensation as they might think the necessities and peculiarities of the case justly demanded. The defendant's lamps were lighted by the means of what was termed "mineral spirits" of naphtha, the tube of which lamp ought to have been "brazed" instead of being, as this one was, "soldered." Hence the explosion and the consequent injuries.

In support of the case for the plaintiff

James Hall was called, who stated that he was in the service of the defendant, who was the patentee of the "Holiday lamp." He remembered the wife of the plaintiff coming to the establishment on Holborn-hill some time towards the middle of March last year, and making a purchase of one of their lamps. He had had it charged and lighted up, and he had then shown her how it was used, how it was supplied, and the manner in which it ought to be managed and treated. There was not a lamp went out of their establishment until he had himself tested it with a view of seeing that it was in a perfect working and safe state. When this particular lamp had left the defendant's place it was in a perfect and complete condition. The defendant lived

at Huddersfield, but he himself, as an engineer, tested all the lamps they made.

Cross-examined.—The defendant was a chymist at Huddersfield, and, being a manufacturer of the "mineral" naphtha, had taken out the patent for this lamp. The lamps, of course, were not made by the defendant, but by another person. The defendant had patenteed the invention about two years ago, and had already sold upwards of 20,000 of the lamps. The various portions of the lamp were made by other persons, but the defendant himself had them put together and made correct. The price of the lamp that was sold to the plaintiff was 8s. The "mineral" naphtha was placed in a globular chamber, from which descended a curved pipe, at the end of which was the part where the flame was applied. At this point there was a small cup, in which was deposited a small quantity of "wood" naphtha, which was lighted with the view of generating a heated vapour or gas, and thus to cause the "mineral" naphtha to come down the pipe and so feed the cup from certain holes around which issue forth brilliant jets. The pipe was only heated by this process for about three inches from the extreme end, at which the cup and burner were situated. At the top of the pipe was a valve, by which the supply was regulated, whilst there was some "stuffing" placed within the tube, about four inches up, through which the naphtha passed towards the flame. By this process the spirit or vapour slowly, but regularly was supplied. There was a "pin-hole" for keeping the stuffing in its proper place, and a brass plate was "soldered" in, and fully resisted the heat of the flame. Solder was composed of lead and block tin, whilst the process of "brazing" was accomplished by the use of brass. After the accident the plaintiff brought back the lamp, when it was suggested that it should be tested, so as to find out if it was leaky, and if so, at what part. The plaintiff, however, refused to allow the lamp to go out of his own hands, but said that, if the defendant would take it back and return the amount which had been paid for it, he would say nothing further about the affair.

Mr. Suggett, a machinist and lamp-manufacturer at 23, Great Queen-street, stated that the lamp in question had been improperly soldered in several places. But this lamp was not fit for the generation of gas, even though it had not been so soldered, seeing that the tap or gas cock was absent from the centre of the pipe. That pipe, too, was too small, for it was only Birmingham "quarter-tubing," whereas it ought to have been what was called "three-eighths" tubing. His objection, however, was not so much to the smallness of the tubing as to its want of sufficient substance in the metal. If it were "brazed," this tube would bear a pressure of about 300 lbs. to the square inch. A perfect tube, to be safe, ought to be capable of bearing a pressure of 800 lbs. He saw that there was a longitudinal crack in this tube. The soldering was in a part where it would be sure to be affected by the heat at 300. Ordinary heat would not operate upon or melt "brazing," which would not melt even at a temperature of 500. In fact, it required the same amount of heat as brass itself. He should give it as his opinion that this lamp which had been sold to the plaintiff was not a sound and perfect lamp at the time of the sale, and, therefore, not fit for use. He had had, perhaps, as often as five or six times in a week to put new tubes to the defendant's lamps.

Cross-examined.—He was a maker and seller of lamps himself, and, in the course of his business, had seen many of the defendant's lamps, and it was only the last week that he had had between six and seven dozen to fit up for Cremorne Gardens. He had never applied to be appointed the agent for the sale of these lamps. He had a patented lamp of his own, and had also been examined as a witness against the defendant when a trial took place as to the validity of his patent.

Mr. Watson addressed the jury on behalf of the defendant, and submitted that the accident had, in truth, been caused by the woman herself, who, in handing up the lamp to the man who was affixing the staple to the ceiling, must have tilted the lamp in such a way as to cause the spirit to run out of the top of the reservoir, and hence the ignition and subsequent painful consequences.

Mr. Baron Parke, having summed up, left it to the jury to say, by their verdict, whether they thought that the defendant had or had not sold a perfect and safe lamp.

The jury retired, and, after an absense of one hour and a half, returned a verdict for the plaintiff—Damages £10.

Defries's Patent Bath.—M. Defries, so well known by his dry gas meter, has taken out a new patent, which promises to excite attention, the object achieved being one in which the public just now will, no doubt, be disposed to take considerable interest. We were invited on Saturday night to witness an experiment at the establishment of this gentleman, in Regent-street, and the advantages of the "Patent Bath," the ground of the invitation, were so fully and completely developed, as to leave no room for doubt as to their future countenance. In an ordinary bath, forty-five gallons of cold water were thrown. A tray of gas jets (heating, by a most ingenious apparatus attached to the bottom of the vessel, a large amount of metallic surface, and keeping up a rapid succession of displacements as the fluid becomes gradually hot), raised in the incredibly short period of six minutes, the temperature of the water to 106 degrees, the consumption of gas, which, like the time, was accurately measured by a bystander, being barely 28 feet, involving a cost little exceeding one penny! A lesser amount of time and gas would obviously have sufficed to obtain a sufficiency of heat for all practical purposes; and hence the extraordinary novelty and economy of the process. The experiment, which took place in the presence of several scientific individuals, was pronounced conclusive by all who witnessed it; in fact, the generation of the hot water was so rapid, and the method of accomplishing it so easy and simple, as to leave not the remotest doubt of its availableness in all public or private houses. The contrivance which secures these desirable results is remarkable for its extreme ingeniousness; and it was intimated that it would in a short time be made the subject of an experimental lecture at the Polytechnic Institution. The expense of fitting up a bath with the necessary apparatus, where a service of gas is at hand, is stated to be moderate; and the convenience of having hot water at hand in such large quantities cannot be over-estimated, as a moment's reflection will determine.

Gas Explosion.—Between two and three o'clock on Sunday morning, two men, named John and Joseph Maurice, toll-takers at the Woodford-gate, Essex, John Serror, supposed to be an assistant, John Pollen, a gas-fitter, and Mary Anne Maurice, the toll-keeper's wife, together with her infant child, were brought to the London Hospital in a most lamentable state. On the previous night, one of the toll-keepers observed that there was a large escape of gas in the vicinity of the toll-house. He at once sent into the village for Pollen, who, unfortunately, entered suddenly with a light to ascertain from what direction the escape was taking place. Ignition was instantaneous, and an explosion ensued. Those in the vicinity hastened to the spot, when it was found that the toll-house was blown up, the roof being completely shattered, and the five persons above named were lying in a most distressing state. It is apprehended the child is the only one of the party likely to survive.

Parliamentary Intelligence.

GREAT CENTRAL GAS CONSUMERS' COMPANY.

MAY 7.—FIRST DAY.

The select committee appointed to investigate the merits of this scheme commenced their labours this day. Present—Mr. Cardwell (Liverpool), in the chair, Mr. Marshall (Leeds), Mr. G. Earle Welby (Grantham), Mr. Pilkington (Blackburn), Mr. M. Portal (Hants).

The following local members were associated with the committee:—Sir James Duke (London), Lord Dudley Stuart (Marylebone), Mr. Thompson (Tower Hamlets).

Sergeant Wrangham, Mr. Hill, Q.C., Mr. James Wilde, and Mr. Taylor appeared as counsel for the promoters.

Mr. Talbot, Q.C.; Mr. Hope, Q.C.; Mr. Burke, Mr. Corrie, and Mr. Warren were the counsel for the parties opposing the bill.

Sergeant Wrangham regretted that the state of the health of his learned friend (Mr. Hill) devolved upon him the duty of opening the case for the promoters. Coming, therefore, late into the case, and free from any feeling created by connection with the foregoing struggles, and looking at it thus impartially, it was really, in his opinion, an unopposed bill; that was to say, that, notwithstanding the numerous petitions (each signed, be it remembered, by few persons, and a testimony only to the industry of the agents against the bill), all the opposition was based upon unreal fears and popular outcery. If it were important to any commercial community to have a plentiful supply of gas—pure, good, and cheap—it was most especially essential to London, almost as essential as pure air and water to the preservation of health. The facts of the case were the best justification of the preamble. The promoters proposed to limit the district which they were to light to the city of London proper, and (their works being at Bow-common) the immediate districts through which their mains passed from the works to the City. The city of London, however, was the chief object they had in view, the remainder being merely the result of the fact that where the mains passed they could supply the inhabitants cheaply and conveniently. Now, as to the mode by which the present companies supplied the citizens with gas, it was not to be denied that it was one which called for interference, inasmuch as it had given rise to a monopoly that left the consumers completely at their mercy for a great number of years, so much so, indeed, as to have given rise to the present measure. The first act for a gas company in the city of London was that passed in the year 1810, and that was the Chartered Company; that was one of their principal opponents. There was then, in 1817, a company established called the City of London, which it would be necessary to distinguish as the City Gas Company, because there was another called the London, but with which he had nothing to do, though they were there under another name in the hydra-headed opposition to the bill. The Chartered Company was started in 1810; they had three several establishments for the manufacture of gas. They had a very large district extending into Finsbury, and the whole district west of Temple-bar up to Pimlico on the west and Vauxhall-bridge on the south. When the committee come to look at certain allegations, the fact that these three establishments were at some distance from their lighting districts was of some importance. They had two different establishments—one at the Curtain-road, another in Brick lane, by which the portion of the City supplied by them was served. Their other works were so scattered about to meet their supply in different portions of the metropolis,—in fact, the places supplied by them were so straggling from their works,—that it would at once be seen how very much they had neglected system in distributing an article the price of which to the consumer mainly depended upon cheapness of distribution. The committee had but to look at the map, and they would see where the Chartered Company supplied, those districts being marked green. There was a clause in their act by which, with a prescience which did credit to the Legislature of the day, it was provided that the act should not interfere with any right then possessed, or which might hereafter be acquired, by any party to light the City with gas, and thus barred for ever any claim of "vested interests." This was a wise provision of the Legislature, because it naturally foresaw that a time might arrive when gas would be required more extensively than at that period, and it was necessary to prevent anything like monopoly. So far, then, their exclusive right to supply those districts was settled against them. What their capital was it was difficult to say. They made a return to Parliament in 1847, in which it was stated to be £900,000, and last year it appeared from their statements to be

£600,000. But, whatever their amount of capital, a very small part of it was due to that portion which the promoters now sought to invade. The district lighted by them out of the City was more straggling, and the larger portion of their capital was not expended within the City rules for the benefit of the City. The cost of production was small in comparison with the expense of distribution. Gas, of itself, could be produced very cheaply; he (Sergeant Wrangham) lighted his house with gas manufactured by himself. In these districts they were, moreover, exposed to the competition of rival companies; as, for instance, the London and Equitable, in the district of Tottenham-court-road, and also down to the Birdcage-walk. Was it not plain that they had a large portion of their capital embarked in those outlying districts, and yet they did not pretend to say they had a right to supply those places exclusively? In the City itself they were long undisturbed; but in the year 1817 an act was passed establishing the City Company. That was originally a joint-stock company, or partnership of persons associated together, but not incorporated by act of Parliament; just as those he represented were a company completely registered and enjoying all the privileges conferred by an act of Parliament—privileges his clients were now seeking. The City Company at that time was exactly in the same position as that in which his clients now were in 1850. Their agent was Mr. Tyrrel, a gentleman fully acquainted with all the secrets of the gas company; and, if he wanted authority for the course he now pursued, he should seek none higher than the example of Mr. Tyrrel and the City Company forty years ago. They then took powers to light Westminster and Southwark, but they wisely confined themselves to the City, and a more profitable enterprise was never known. In 1817 they were established, and in 1820 they were dividing 10 per cent., and the bonuses besides were said to be handsome. Their capital was £200,000, and so flourishing had the concern been with the 10 per cent. and the bonus (which he supposed was like the Scotch "mile and a bittock," which meant a mile and three or four more to it), that, when anybody could be persuaded to sell out, the shares fetched a premium of no less than 300 per cent.; so that they had a pretty long and a pretty rich reign. The acts incorporating these companies contained a provision permitting the interference of the Secretary of State for the security of the public, and in 1822 the Secretary of State did so interfere, and then appointed Sir W. Congreve to examine into their affairs. Sir W. Congreve upon that divided the City between these two companies, instead of both running their mains over the whole district; and it was now hinted in some of the petitions that this arrangement was to bar for ever any invasion of the City by any third party. It was nothing, however, but a mere prudential regulation, arising from the fear that from the intermixture of mains some catastrophe might ensue. This was, however, an unreal and shadowy fear, for the fact was, where any explosion had taken place it had invariably been where a company possessed a monopoly. To show how futile was the hint that this arrangement of Sir W. Congreve was a definitive appointment, it was a fact that the arrangement (which affected all the companies in the metropolis) had frequently been set aside.

The CHAIRMAN: Sir William Congreve's arrangement was upon the grounds of public safety, and not upon tariff.

Mr. Sergeant WRANGHAM: Just so. In 1829 "The Imperial" territory was invaded by "The Independent;" in 1831 the territory of "The Chartered," outside the City, was invaded by "The Equitable;" and in 1832 "The London Company" obtained a bill by which it was entitled to interfere with "The Imperial," "The Equitable," and "The Chartered." Although at peace within the walls, "The Chartered" was exposed to competition *without*, and the result was successive reductions in price outside the walls; the price within the walls being kept up as long as possible. But the citizens of London, although, in the main, very patient animals, had, by agitation, effected a reduction from 10*s.* in 1827, to 6*s.* in 1846. The effect of competition was strikingly illustrated by this history. Although gas could be supplied at a cheaper rate in the City, from the greater density of the consumption, they charged a higher rate in the City, where they had a monopoly, than they did out of it, where there was competition. A citizen, named Hale, whose premises were partly on one side the boundary and partly on the other, paid two different rates, 7*s.* and 6*s.*, although the gas was supplied from the same mains through the same service-pipe. At length the competition, or rather the fear of it, had brought the price in the City below that which was charged outside; and whether the low price would continue depended upon this bill. Now, as that monopoly was about expiring, and he hoped the committee would sign its requiem in that room, the existing companies saw the necessity of reducing the price of their gas, and the result was that they were now charging a proper price. That was as it ought to be, but there was no security for its continuing so but by the passing of the present bill. Whether a reduced price was to be permanent entirely depended upon the committee. The present monopoly was one which left the City consumers completely at the mercy of the old companies. It often turned out that a person got into the debt of the gas company and left the house in their debt, but the company lost nothing by that, for they made the in-coming tenant pay the arrear of the old. They could not do so in law, but they did it for all that, for they would not supply the gas to the new tenant until he paid the debt of the old; in that there was a perfect harmony between the two companies, and they were as absolute in carrying out the principle as the Autocrat of Russia in carrying out his desires. There was no remedy for the consumer, for he could get gas from no other quarter. The City consumers determined not to submit to this system any longer, and then petitioned the corporation, and many large ward meetings had been held, and in 1846 they established a gas committee for the purpose of devising a remedy. They made many remonstrances with the old companies, but without effect, and at last the commissioners of sewers instructed the City solicitor to make a report to them as to the practicability of procuring a good and cheap supply of gas to the consumers. This Mr. Charles Pearson did, and he reported in favour of a reduction, and suggested that, if certain securities were given, and the prices reduced, no new company should be introduced into the City; but, finding that the capital upon which the Chartered Gas Company wished to secure a 10 per cent. dividend was £600,000, and the City Company upon £300,000, he altered his opinion, and eventually recommended the commissioners to give notice for a bill themselves. At that juncture Mr. Croll, a gas engineer of some eminence, with a party of gentlemen, was engaged in projecting a company which should consist of consumers as well as capitalists; the only real security that a surplus over 10 per cent. dividend would be applied to the reduction of the price of gas. The commissioners of sewers, finding that there were objections to their being gas venders, withdrew their bill in favour of the new company. In September, 1849, the new company was provisionally registered, and a subscription contract was signed; but they were in a year when the terrors of their responsibility were rife, so that it was only by Mr. Croll becoming responsible for all the preliminary expenses of the bill that gentlemen in the city of London were induced to join the enterprise. At the instance of Mr. Pearson, however, gentlemen of great commercial reputation, Mr. Dakin, Aldermen Humphery and Finnis, Mr. Bennoch, and others became directors. In March a great meeting of the citizens was held in favour of the bill, and the bill was brought before a committee of that House; and after eight days' proceedings, by a happy thought (he did not know whether it was his friend Mr. Hope or Mr. Talbot who hit the white), an objection was raised that notices given for a company in the City did not apply to one with works out of the City; the objection being fatal in this point of form, the bill was withdrawn. He might, however, say that great commendation was given by the committee to Mr. Croll, and the promoters believed that, if that formal objection had not started up in this way, they would have succeeded. Shortly afterwards the company was completely registered; and about this time a circular found its way from Mr. Tyrrel, the agent of the Chartered and City Companies, to the gas companies all over the kingdom, inviting them to make common cause against the new company, and suggesting that the provincial companies should try to influence members of Parliament against it. He should have mentioned that at that time a large number of gas consumers had agreed to take the gas from the company, and at the present moment more than 6000 gas consumers in the City were under contracts to take the gas for five years, at 4*s.* per 1000 cubic feet, involving a consumption of 250,000,000 cubic feet annually. The capital of the company was proposed to be £150,000, with power to increase it to £250,000. The works were to cost £136,000, and they would by that outlay be enabled to manufacture 320,000,000 cubic feet of gas. Upon this an allowance of one-sixth must be made for leakage, which would leave about 270,000,000 cubic feet available for sale. That quantity at 4*s.* per 1000 cubic feet would give a sum of £53,000; and, deducting the cost of manufacture and distribution from that sum, together with 10 per cent. on the outlay, a sum of £8624 would remain to be applied to the reduction of the cost to the consumer—a reduction, in fact, of nearly 8*d.* per 1000 cubic feet. The learned counsel denied that any injury could be done to Bow in a sanitary point of view by the establishment of gas works, that place being already filled with manure manufactories and all kinds of abominations; and by challenging the fullest inquiry into the accuracy of his statements and the merits of the scheme. He then concluded a three hours' argument by calling upon the committee to allow the present bill, which was a *bonâ fide* consumers' bill, to escape the hydra-headed opposition against it, by declaring the preamble of the bill proven after hearing the evidence in its favour.

Charles Pearson, Esq., M.P., examined by Mr. WILD.—A little before 1833 his attention was directed to the subject of the supply of gas to the city of London. He also gave it his consideration in 1843; and in 1847 the complaints of the gas consumers in the City became so loud and urgent that the corporation instructed him to make some inquiries, and the result was, that he ascertained gas could be supplied at a much cheaper rate than it was then sold to the citizens, and he reported accordingly. He based that report upon the fact that the cost of gas was not in the production, but in the distribution. It was a matter well ascertained that an area like that of the city of London, with the consumers within a small compass, could be supplied at a cheaper rate than a larger area where the consumers were spread over it, and of course requiring a large outlay for mains and other pipes. He was not the solicitor for the commissioners of sewers; he was the solicitor for the corporation, who appointed the commissioners of sewers; the solicitor to that body was the solicitor to one of the opposing companies to the present bill. His report advised that a large reduction should be made in the then price of the article, and it was his opinion that should the reduction, as proposed, be agreed to by the existing companies, there would be no necessity for a new or competing company. His proposition was, that the existing companies should reduce their gas to 4*s.* the thousand cubic feet, and that, after dividing 10 per cent., the surplus should be applied to a further reduction in the price of the article, or to some sanitary improvement for the benefit of the citizens. The companies would not agree to that, and he then recommended the commissioners of sewers to apply to Parliament for a bill empowering a new company to supply the City. There were then some gentlemen associating themselves for the same purpose into a joint-stock body, for the purpose of supplying the wants of the citizens, and the commissioners thought it better to allow an independent body to apply to Parliament, rather than that a corporate body should take the question up. The bill before Parliament last session was the bill of that company, and it was withdrawn in consequence of a non-compliance with the standing orders.

Mr. Speaker having been announced at prayers, the committee adjourned to twelve o'clock on May 8.

MAY 8.—SECOND DAY.

Mr. Pearson's (M.P.) examination was resumed by Mr. WILD.—In the month of December last the commissioners of sewers gave their consent to the company laying down their pipes, upon their binding themselves to supply gas at the specified reduced rates, and also upon other considerations, having due regard to the convenience of the thoroughfares, and other considerations provided for in the clauses of the bill. The company had entered into a contract with Messrs. Peto and Betts for the construction of their works, and that firm took 5000 shares. They intimated their intention of withdrawing in the month of March last. They withdrew because the company could not get the ground for their works by the time for which they had stipulated with the contractors. Those gentlemen, of course, threw up their shares, but they subsequently, to show their confidence in the company, took 100 shares. The contract was taken by the Messrs. Rigby, who took 3000 of the shares given up by Peto and Betts. The only reason assigned by the latter gentlemen for giving up the contract was, that the land for the works was not ready according to the terms of the contract. The contract with Peto and Betts specified the time when the works should be commenced, and, of course, the site not having been fixed upon, there was an undoubted end of the contract so far as those gentlemen were concerned. Had every confidence in the proposed company, and believed it to be the only safeguard for City gas consumers against the companies now existing. He was not averse, however, from a compromise on satisfactory conditions, and such an attempt had been made. He stated that the arrangements proposed to be entered into between the old companies and the promoters of this bill were broken off in consequence of the old companies requiring a dividend of 10 per cent. on capital of £880,000, which payment the promoters felt would stereotype the price of gas at its present amount. The promoters contemplated only a capital of £150,000 at first, and of £250,000 should the demand for supply of gas be increased as was expected.

Cross-examined by Mr. TALBOT, Q.C.: For many years past his attention had been directed to the subject of gas. It was not subsequent to 1848 that he took an interest in the question. He had been a shareholder in the Tottenham Gas Works, of which Mr. Croll was then manager. It was a profitable undertaking. Could not say that either of the two City companies had increased their capital since 1848. The last return made by them was in 1847. Alderman Humphery and Alderman Finnis had, at the request of witness, become directors in the new company. They became so on the understanding that they were to be replaced at a period favourable to the interests of the undertaking. They had retired since. Both gentlemen had not sold their shares; Alderman Humphery disposed of his shares to Mr. Bradbury, who succeeded him in the directory. Alderman Finnis, though retiring from the directory, had not parted with his shares: he still held them. The directors were all gentlemen of wealth and standing. They held the shares necessary to qualify them; many held a larger number than that. The original number of shares in this undertaking was 25,000; but only 15,000 were taken up. A call of £5 per share had been made on 9164 shares, which had realized £34,000. The whole of the call would not be due until the 28th of May instant. The sum realized, with the exception of between £13,000 and £14,000, had been expended in the payment of parliamentary expenses, purchase of land, contractor on account of works. Mr. Croll, the engineer, held 1250 shares. There was an agreement between him and the company to the effect that, instead of the usual remuneration paid for engineer's superintendence, he should receive a gross sum of £4000, payable in two instalments, that was to say, if the company should gain 5 per cent. on their outlay at the end of 1851, he was to receive £2000; if not, he was to forfeit that sum; and, if at the end of 1853 the undertaking yielded 10 per cent., he was to receive the other £2000; and, failing that profit, the further sum of £2000 would also be forfeited. In the parliamentary deed they gave the number of shares subscribed for as fifteen thousand, and that was correct. Out of that number there were seven thousand taken by Mr. Croll, but it was only conditionally, and the shares held by him were afterwards transferred to Peto and Betts, as they were chosen contractors. Upon the latter gentlemen giving up the contract, three thousand of the shares were taken the Messrs. Rigby. The one hundred shares held by Peto and Betts were paid up in full. The contract held by Mr. Croll was to manufacture the gas and put it into the gasometers, and that contract was to last for seven, fourteen, or twenty-one years, under heavy penalties, and as security he had insured his life for a large sum, and deposited several valuable patents. The one respecting which there was lately a question in one of the law courts was not one of them. (A laugh.) Knew a gentleman named Massey: he was a friend of witness, and entered the company at his request. He held five hundred shares, and it was true that he had expressed a wish to part with some of them. Witness had never agreed to take any number of them himself, but he should have no difficulty in getting a considerable number of them off his hands. He had never expressed his fear of the scheme, but had merely intimated that he wished to be lightened of a portion of the shares, as five hundred were too many for him to hold. Had never heard of a gentleman named Vallance asking the company to take his shares off his hands. He looked upon such allegations as calumnies propagated by the existing companies. There had been a regular system of misrepresentation resorted to by the old companies for the purpose of damaging this undertaking in the eyes of the public. Parties who had not a single share in it had been sent round from door to door, pretending to be desirous of parting with their shares in it at a great discount.

Cross-examined by Mr. CORRIE: He did not think that 10 per cent. was too much profit to be received by a company that fairly exerted itself to manufacture and supply gas according to the most recent discoveries. There were two deeds lodged in the Private Bill-office—the deed of the joint-stock in corporation was put in, and the parliamentary deed.

The CHAIRMAN: Supposing the City were properly supplied with gas by the existing companies, and they only able to divide 10 per cent., do you think there would be room for a new company to come in?

WITNESS: Supposing the existing companies had exerted themselves by using every improvement in giving that supply, then he would be of opinion that no new company could come in.

By Mr. CORRIE: The company might have gone on as a joint-stock body, and supply the City with gas, but it was at his (witness's) request they applied to Parliament for an act. He made that request upon principle as a public servant, for he considered it right that a company should be bound by act of Parliament to carry out the benefits promised to the consumers.

At the request of the learned counsel the deed of incorporation was put in.

Cross-examined by Mr. WARREN: He held fifty shares in the undertaking. He and his friends last year held about 1000. He attributed the depreciation of the shares to the calumnies of the opponents of the project. Mr. Croll had staked £20,000 on the success of the undertaking This company proposed, no doubt, to pass through the most profitable district of the Commercial Gas Company, viz., Whitechapel and Mile-end Old Town. That company was established in 1839, and had reduced the price of gas in that district from 9s. to 6s., and had compelled the previously established companies to follow their example. He had never heard of any complaint being made against their management. Since this undertaking had been projected they had reduced the price of gas from 6s. to 5s.

Mr. Edward Harrison, deputy of the Cornhill ward, and also commissioner of City sewers, examined by Mr. HILL.—The complaints of the City gas consumers were very general as to the high price they were charged by the existing companies. The commissioners of sewers took the matter up, and, after some active negotiations, a deputation, of which he (Mr. Harrison) was one, waited upon the existing companies to urge upon them the absolute necessity of reducing their charge, but they refused, stating that any reduction was quite impossible. The result of the deputation was, that they left the companies without any hope of a reduction. Many meetings were then held upon the subject, and, as far as he could judge, he had never seen a more decided expression of public opinion in favour of any project than that expressed by the City in favour of the new company. It was on witness's motion that the commissioners of sewers agreed to allow the promoters to lay down their pipes. The commissioners numbered about eighty, and out of that number there were about forty-six present, which was considered a large meeting. The old companies reduced the price to 4s.; and after that reduction there were several ward meetings, at which the question was considered, and motions carried in favour of supporting the new company. It was felt that the reduction would not be permanent unless the new company came into operation; and in his own ward they passed a resolution requesting Mr. Pearson to continue a director of the new company until the bill had received the sanction of Parliament.

Cross-examined by Mr. BURKE: Supposing the existing companies bound themselves in perpetuity not to take more than 10 per cent. dividend on their capital, and to give an adequate supply of gas at a moderate rate, would it not be better for the City to be content with such an arrangement than if this project were sanctioned and the public thoroughfares necessarily opened to the impediment of traffic?—As a commissioner, I could not consent to anything of the kind. He was not aware that it was impracticable to lay the pipes of this company at night. Mr. Croll, the engineer, had informed him that they might be laid at night. Had not sought for any other opinion.

The CHAIRMAN said it was the wish of the committee to take nothing but material evidence, and they did not wish to have the same waste of time on that inquiry as had taken place in the previous session of Parliament, when eight days were wasted before an objection was raised, which caused the bill to be withdrawn. If there were any objections to be raised against this bill upon the grounds of informality, or otherwise, the opponents had better do so at once, for the purpose of saving time.

Mr. Fickling, of Bishopsgate, was then called, and examined by Mr. Sergeant WRANGHAM.—The witness deposed to the general desire of the gas consumers of the City for a cheap and abundant supply of gas, and stated that the reduction from 6s. to 4s. made by the existing companies had stimulated consumption. He had himself put up lights in the upper part of his house, owing to the reduction, and several of his neighbours had done the same. The witness then detailed several grounds of complaint with regard to the meters.

The witness was cross-examined, but nothing was elicited to shake his evidence in chief.

Mr. CORRIE called the attention of the committee to the words in the preamble of the bill, which stated that it was a bill "for the purpose of manufacturing, purchasing, and supplying the city of London, and the liberties thereof, and other places adjacent thereto, with gas." Now, he considered that the words "and other places adjacent thereto" did not include Bow, which the promoters proposed to light.

The CHAIRMAN said the committee were of opinion that the words "and other places adjacent thereto" gave them the power of lighting Bow, as it was sufficiently included in the words "and other places adjacent thereto."

The committee were now about to adjourn, it being four o'clock, when

The CHAIRMAN said that, as the sitting on the next day would in all probability be a short one, owing to its being Ascension-day, they would, if the parties thought proper, meet at eleven o'clock, or, if they preferred saving the expense, they would adjourn over to Friday; indeed, the committee wished to save all parties expense, and they

would be ready to commence sittings every day at eleven, instead of at twelve o'clock.

Mr. Sergeant WRANGHAM would remind the chairman that the only time counsel had for consulting with their clients was the brief period before the usual hour of sitting, namely, twelve o'clock.

The CHAIRMAN was aware of that, and did not wish to disturb the arrangement, and they would, therefore, adjourn to twelve o'clock on May 10.

MAY 10.—THIRD DAY.

Mr. Hall, of Bishopsgate-street, and several witnesses residing in the Mile-end and Whitechapel districts, were examined to prove the great desire of their neighbours to be supplied with gas at the lowest rate, but no new facts were elicited. Most of them on cross-examination admitted that they knew nothing as to the cost of manufacturing and distributing gas, or of the loss which the old companies must sustain by the admission of another company.

Dr. Leeson, F.R.S., examined by Mr. PITT TAYLOR.—Has had considerable experience as a practical chemist, and for twenty years his attention had been directed to the subject of gas. Was applied to by Mr. Croll, at the latter end of last year, to test the illuminating power of the gas supplied by the London companies. Did so in company with Professor Graham, Mr. Clegg, and Mr. Methven, on two occasions, Oct. 8, and Oct. 22. Used a photometer with a standard spermaceti candle of 6 to the pound, burning 132¼ grains per hour. Compared the light given by the standard candle with that given by a 16-hole argand burner, consuming 5 cubic feet of gas per hour. Used one of Croll's meters to ascertain the quantity of gas consumed. The meter had been tested by measuring the quantity in the gasholder. Found the gas so unsteady and variable in its pressure as to render it necessary to use a governor, so as to conduct the experiment with accuracy. The photometer he used is the one in general use. All the parties present took separate observations, and the mean was ascertained. In the first experiment of Oct. 8th, the gas supplied at 7 o'clock was equal to 8 candles. This was from the Brick-lane station. In the second experiment upon gas supplied from the Curtain-road station, at 8 o'clock the same evening, it was equal to 8¼ candles. In the third experiment upon the City Company's gas, it was found to be equal to 8¾ candles. In all three cases litmus paper was reddened, indicating the pressure of ammonia. Found no trace of sulphuretted hydrogen. Tested the gas again on Oct. 22; the Curtain-road gas was equal to nearly 9½ candles, the City Company's to 8¾ candles; all were contaminated with ammonia as in the previous trials. The Brick-lane gas, from some cause or other, was so bad that he hardly thought it was a fair experiment; 5 cubic feet gave a flame scarcely ¼ of an inch high; the same meter and burner were used as in the previous experiment; considered it an exceptional case; 5 feet were barely equal to one candle; this was at the Guildhall Coffee-house: all the other lights were burning fairly, because, by opening the cocks and turning a very large quantity, they could remedy the defect. Supposed they were burning and paying for nine times the quantity they should have burnt. If gas is impure, a larger quantity must be burnt to supply a given amount of light. An ordinary observer would not be able to ascertain whether the gas on a particular night was good; the exact quantity consumed must be ascertained. The smell would scarcely test that; if the gas were largely diluted with atmospheric air, which was probably the case, that of course would not produce the smell; air might have got into the pipes from some of them having been recently interfered with, or have been pumped in by means of an exhauster. Made a report to the Company, in which he suggested that 9½ candles should be the standard to be adopted by Mr. Croll. Has since tested the gas; found that of the City Company had improved considerably; it had no appreciable quantity of ammonia; the illuminating power had also increased; it is now about 9 candles—9½ candles may be taken as the average of the whole metropolis. Is acquainted with Mr. Croll's patent for purifying gas; it takes out the ammonia, sulphuretted hydrogen, and other compounds; has examined his plan for setting retorts, and seen it at work at Tottenham; it appeared to be exceedingly effective and economical, lessening the destruction of the retort, and the consumption of fuel, and consequently lessening the cost of producing gas.

Cross-examined by Mr. BURKE.—Had not had any experience as a gas maker. Was merely professionally concerned in giving advice and assistance. Had no other experience excepting the observations made at Tottenham, and judging from the general effect by the experience he had in the erection of furnaces as to the probable economy and effectiveness of the plan. Had not been upon the works for any length of time so as to enable him to make any observations, such as seeing the coal put into the retorts, or ascertaining the quantity of gas produced; or, in fact, actually remaining upon the works for any length of time so as to acquire positive knowledge upon the subject. Did not know whether Mr. Croll has any patent whatever for this process. Had no experience in the working of the patent for purification. Can only judge of its effectiveness by his knowledge of chemistry. Believed it to be a valuable one. Did not know when it was taken out, or whether it had been offered to any of the existing companies, and refused by them. Made the experiments on the illuminating power, in consequence of an official communication from the secretary of the Central Gas Company. Had been remunerated for his services. Was accompanied by Mr. Croll and his two assistants. They indicated the spot where the test was to be made. The landlord of the Guildhall Coffee-house made no complaint. The streets were not in darkness, but, as already explained, the gas might be very bad in the house, and yet give sufficient light by the expenditure of a much larger quantity through the cocks being opened. Did not mean to say that the company sent round and opened the cocks of all the public lamps; the probability is, that the cocks were opened, or the pressure increased. When the lamplighter lit up his lamps he could probably turn the cocks to such a degree as would give a sufficient light. He would not require to be told beforehand that wherever the average was 9½ on one particular night it would be only 1; he would open the cock till he had sufficient light.

The CHAIRMAN: Can a person judge by looking at the cocks whether they are open to the usual extent, or beyond?

Witness: He might perhaps to a certain extent, but it would be difficult, I think, for him to judge solely by the cock.

The CHAIRMAN: Could you, Professor Graham, and Mr. Clegg together, form any judgment as to that, as you were going along the street, or as you were in the coffee-house?

Witness: We might have examined particularly the cocks in the coffee-house.

The CHAIRMAN: Did you do so?

Witness: We did.

The CHAIRMAN: And were they opened more?

Witness: I believe, excepting in the room in which we were, there was scarcely any light burning. I think, if I remember rightly, there were one or two lights in the room into which we were introduced burning; with that exception we did not particularly notice.

Cross-examination continued.—Gas equal to only one candle might be increased *ad libitum* by opening the cock; at all events, to any reasonable extent. It would produce a light equal to 8 or 9 candles, but that might depend upon the form of the cock and the comparative size of the pipe. The flow of gas through a given aperture varies considerably, according to the nature of the gas itself, and therefore a richer gas, as compared with a weaker gas, would not require the same opening in order to pass a given quantity through in a given time. In this instance the gas was a poor gas, and would require a greater body. Under these circumstances it would require the Company to have supplied 9 times their ordinary supply, to equal the average light in the city of London. Did not test the specific gravity. The first experiment of Oct. 8 was made at the manufactory of Croll and Glover, which is supplied from Brick-lane. The pipe and the burner are under Mr. Croll's control. The next experiment was made at the office of the Great Central Company, 48, Moorgate-street; and the third at Anderton's Hotel, Fleet-street: the proprietor is a shareholder in the new company. Did not know the process of purification adopted by the City and Chartered Gas Companies. Never ascertained the quantity of ammonia in the gas. In the late experiments it took a minute to produce the same effect on litmus paper which had before been produced instantaneously. The quantity of light would very much depend upon the mode in which the burner is regulated. Different burners will produce different illuminating powers; some are better and some are worse. There are many circumstances that may improve the flame, such as the number of holes and the height of the chimney; the one used was an ordinary one, about 9 inches high. Is to be one of the referees appointed under the bill. His name is advertised as such in a document headed "Union is Strength."

Re-examined by Mr. PITT TAYLOR.—The bad gas found at the Guildhall Coffee-house may not have applied to all the lights supplied by the Company that night. It might have applied to that particular pipe or main which had got atmospheric air in it, or to a particular hour, and been improved afterwards. It only showed the irregular quality of the gas occurring at that particular spot. Mr. Croll took no particular part in indicating the spot where the experiments were to be made. Cannot conceive that he could have doctored the gas so as to deceive an experienced practical chemist. There was no appearance of anything of the kind, and a great deal of trouble must have been taken had he so intended. Was quite convinced in his own mind that the gas was fairly tried, and that nothing whatever had been done by Mr. Croll to influence the results. The same burner was used in the different places. It is the same as the Company propose to use for their standard.

Professor Graham, F.R.S., examined by Mr. WILDE.—Had written a systematic work on chemistry, and had been lately employed by the Government in chemical investigations. Was now employed in an investigation on the use of lead in refining sugar with reference to the public health. Was present when Dr. Leeson made his experiments, and has heard his evidence. Concurred in what he stated as to the illuminating power. The chimneys and burners were well chosen, and well adapted for trying the experiments fairly. Litmus paper is a test for ammonia, and the rapidity of the change is an intimation of the relative quantity. Had studied Mr. Croll's plan of purification, and had had the working plans and statements before him. The use of coke as fuel instead of tar or coal will prevent any opaque smoke being sent into the atmosphere. This was a part of the plan. The ammonia which is often improperly exposed, and the sulphuretted hydrogen from the waste lime, are the principal offensive exhalations from a gas work. Does not know whether the companies use coke as fuel. In Mr. Croll's process the sulphate of lime is exposed to a flame from the waste heat of the furnaces, whereby the sulphuretted hydrogen is destroyed. The use of chloride of zinc or chloride of manganese, for the purpose of purifying gas, arrests the ammonia and the sulphur at the same time. Less lime is therefore requisite, and that which is used is deprived of its noxious power by being exposed to a very strong heat. The result of using the chloride of manganese and dealing with the sulphate of lime in the way proposed by Mr. Croll is that a much less quantity of the sulphate of lime is produced, and what is produced destroyed. There is great difficulty under the present system of purifying gas in disposing of the sulphate of lime. The lime takes up the sulphur from the gas, but the lime cannot be got rid of without setting free a large quantity of sulphuretted hydrogen. Attended the Board of Health, and there gave the same explanation which witness now gave to the committee. In a sanitary point of view gas works would be better at Bow than in the City.

Cross-examined by Mr. TALBOT.—Had not contemplated the pulling down of the City Gas Works. The process of heating by coke and disengaging the sulphuretted hydrogen, and all the rest which witness had described, were detailed in the working plans submitted to him by Mr. Croll and other parties. The mode detailed depends

upon chemical agencies; the combination of the apparatus is peculiar. Was not aware to what extent the different parts of the plan were patented. There would be no difficulty in other companies using the same patent upon terms with the patentee, should it be worth the paper on which it is written. Was present at the experiments on the one candle gas at the Guildhall Coffee-house. The same burner was used in all the experiments, and was the one belonging to the apparatus. (The burner was here produced.) Should not think the length of the chimney would make much difference in photometical experiments. Never had occasion to measure one candle gas before. Had seen gas quite as bad, but never measured it. Was to be appointed to the office of referee under the bill to protect the public. Was appointed by the favour and goodwill of the gentlemen who promote this scheme. Should consider 14 candle gas as good gas. Entire freedom from ammonia in gas is not practicable. Once found the proportion about 1 in 1,000,000 in one of the City Companies' gas. This was on a recent occasion. Did not take the specific gravity. It is to a certain extent a test of gas. It is not a very simple process, but more so than finding out the millionth part of ammonia. The experiment on the illuminating power was conducted with a candle placed in a spring candlestick. (A candle and a Palmer's candlestick were produced.) The object of the spring was to keep the candle at the same uniform height, like a carriage lamp.

Re-examined by Mr. HILL.—The richest portions of gas are of high specific gravity, but at the same time one of the most injurious gases which can enter into coal gas, is of high specific gravity also, so that unless an experiment on specific gravity is combined with an analysis it may lead to fallacious results. His impression was that there is little use in taking specific gravity unles it is repeated several times, and taken in conjunction with an analysis. The diminution in illuminating power to one candle might have been produced by a small admission of atmospheric air which diminished the illuminating power. It would heighten the specific gravity, and this is one of the fallacies of that test. Had no doubt of the accuracy of the experiments. The chimney used was a common 7 or 8 inch chimney, the same in each of the experiments. Nothing sensible would depend on the chimney. Had no reason to suppose that the gas had been tampered with.

To the Committee:—Did not examine the pipe at the Guildhall Coffee-house. Observed that the whole house was in darkness. Believed the night was foggy. Did not observe whether the cocks were unusually widely opened. The widening of the apertures of the burners would have the same effect as opening the cocks. Should not suppose the burner could have been so much opened as to let out 9 times the usual quantity of gas, but has no doubt it would allow 4 or 5 times the usual quantity to escape. On an ordinary night, when the gas was of its usual power, the escape of 4 or 5 times the usual quantity would produce a smoking flame, so that any person would be induced to adjust the flame so as not to produce smoke. When gas is rich the same quantity of gas would produce a smoky flame. When the Guildhall burner was removed, and witness applied his own burner, a very perceptible diminution of light followed. A person lighting a gas-light has the means by a cock near the burner of letting in gas so as adjust the quantity of light which he requires according to the state of the gas in the pipes. Cannot tell at all at what angle the cock was while the experiments were being conducted. The deficiency of light was not in the proportion of 1 to 9; there might have been one-fourth.

MAY 13.—FOURTH DAY.

Professor Graham recalled and examined by Mr. HILL.—Remembered the experiment at the Guildhall Coffee-house, when a burner consuming 5 feet of gas per hour gave a light equal to 1 candle; and recollected stating that it was probable that four times the quantity of gas might give a light equal to 9¼ candles. Had since made some experiments on gas diluted with air till 5 feet were equal to 1 candle, as at the Guildhall Coffee-house. Twenty parts of air to eighty of gas were sufficient to reduce it; and to increase the illuminating power of this mixture to 9 candles it required the consumption of 10 cubic feet per hour. The illuminating power of gas depends *entirely upon the mode of combustion*, and, the larger the quantity burnt together, the greater the illuminating power in proportion to the quantity consumed. A higher temperature is produced, and the deposited carbon, which is the source of light, is heated to a more intense whiteness. If the quantity of gas is small, and little heat produced in combustion, the flame may be blue and of little illuminating power. These facts explain why the doubling of the quantity of gas consumed should increase the illuminating power 9 times. The metal of the burner exercises a greater cooling power upon a small body of gas, than upon a large one. Tried another experiment in which 1½ foot of air was mixed with 8½ feet of gas, and 5 feet of this mixture gave a light equal to 4½ candles; but when the quantity was increased to 6½ feet the light was increased to 9 candles.

Cross-examined by Mr. BURKE.—The experiments were tried on the 11th inst. at the manufactory of Messrs. Croll and Glover, in the presence of Mr. Clegg. In many cases the illuminating power depends more upon the mode of combustion than upon the quantity consumed; but this is not the universal law. Experiments in illuminating power are always comparative, and the gases are burnt in precisely the same circumstances. The power may be varied under a variety of circumstances. The Company may, by supplying bad gas equal to 1 candle, and doubling the amount of consumption, produce in all circumstances the same effect as good gas equal to 9 candles. This remark applies only to gas of this very low quality. If the proper quantity is exceeded, smoke is produced; but if a burner suited to a particular quality of gas, say 9 candles, were open to double its usual orifice it might not smoke with weak gas. Has made no experiment upon the limit which should be put to the opening of such an orifice, so as to prevent the emission of smoke. Did not ascertain the position of the cocks at the experiment at the Guildhall Coffee-house. If the gas in the streets had been one-candle gas, London would have been in comparative darkness. It might have been that air had got into a particular gasholder used for a short time. The experiment lasted only a quarter of an hour. Did not ascertain the pressure on Oct. 22. On the 18th inst. it was 1 inch.

Re-examined by Mr. HILL.—Considered it arose from some exceptional causes, and, therefore, struck the experiment of Oct. 22 out of the averages. Did not know whether it was caused by leakage of air into the mains or gasholders, or how long it lasted. On the 11th inst. 5 cubic feet gave a light equal to 12 candles. The gas was supplied by the Chartered Gas Company. The excessive differences of increasing the illuminating power nine times by doubling the quantity is confined to gases of very low quality; as the quality is lowered the difference increases, and as the quality is improved it becomes less. Gas may be so rich that if a little more be let on, that little more will go off as smoke, very imperfectly burnt, if at all. In such case the supply must be diminished.

Mr. A. A. Croll, C.E., examined by Mr. PITT TAYLOR.—Had been connected with gas works for about 10 years, and had studied the question 4 years previously. Is engineer to the new Company. Had taken out various patents for the purification of gas by extracting the ammonia.

The CHAIRMAN asked whether the committee were to try the value in law and in fact of those patents?

Mr. TAYLOR said that the object of the question was, not with reference to the question of law, but to show that by means of this patent the Company were in a position to make gas cheaper and better than others.

Examination continued.—Had also a patent for a dry meter, of which about 20,000 had been sold during the last 4 or 5 years. The sale of them has fallen off since his connection with the new Company, at the rate of about 45 per cent. annually. Had a patent for a combination of clay and iron retorts. Ten years since he was resident engineer of the Chartered Gas Company's works at Brick-lane, and carried into effect some improvements. In 1844 he took a lease of the Coventry Gas Works, and worked them with profit for 4 years. Afterwards purchased the Tottenham and Edmonton district from the Imperial Gas Company, and built a gas work there on his own account. Has a drawing of his improved mode of setting clay and iron retorts.

To the CHAIRMAN.—The advantages of the patent are obtainable by all persons who choose to take a licence, the expense of which is 6*d*. per ton on the coal carbonized.

The CHAIRMAN suggested that, being so, it was in the power of the rival companies to avail themselves of the improvements as much as the new Company, and, therefore, the question of the retorts was beside the inquiry.

Examination continued.—The expense to the old companies of adapting their works to witness's system would be considerable. His system was in operation at Coventry, Winchester, Gosport, and Tottenham, and also at Leyden, in Holland. Estimated the consumption of gas in the city of London at 500 million cubic feet, of which about 51 million feet were consumed by the public lamps. The prices now charged are £4. 4s. for a batswing burner, £2. 14s. for a three jet, and 4s. per 1000 feet to the private consumer. Estimated the public lights to produce 3s. 8d. per 1000 feet, after deducting 15s. per lamp for lighting and repairing. Out of the City, the price to private consumers is 5s. per 1000 feet. Estimated the private consumption in Whitechapel and Mile End Old-town at 17,000,000, at 6s. per 1000 feet; and if the price was reduced to 4s. it would save the consumers of that district about £5700. There have been many complaints about meters, but whether well or ill founded is not aware. The water meter is more exposed to surreptitious burning than the dry meter. The former varied in its measurement, and was sometimes against the company and at other times against the consumer.

The CHAIRMAN inquired whether the customers of the City and Chartered Companies had the means of employing the dry meter if they prefer it, and, on being answered in the affirmative, stated that all matters to which both companies had got equal access was beside the question, as the committee were not appointed to try the difference between meters.

Examination continued.—Believed the Chartered Company's mains to be too small in some parts, and that the laying of the new Company's mains at night would cause less public inconvenience than the laying down of larger mains by the existing companies, because, gas being wanted at night, the old companies could not make the alteration at that time. The old companies would be obliged to work by day, as they require the mains for the transmission of gas during the night. Proposed to lay down all the leading mains in the centre of the streets, and taking advantage of all the smaller mains required for the supply of the intersecting streets, and taking from these 2 inch branch mains, which shall run under the footways within 2 or 3 feet of the houses, so that, while the services require to be laid on, a small part of the footway will be disturbed, and no part of the carriage way. Bow Common is 2¼ miles from the City boundary. Coals can be delivered at their station within 2d. per ton of the price which the City Company have to pay, and 2s. 6d. less than the Chartered Company, as they will be taken direct out of the ship in the Regent's Canal basin into trucks, and placed upon the Blackwall Railway, from whence they can be run at an elevation into the retort-house. The works are bounded by the Blackwall Railway, and the Birmingham Junction Railway joins the Blackwall near the works. The Birmingham Junction is in connection with the North Western and Great Northern. The ground purchased is 6½ acres, and had cost £6000. The works were calculated to produce 320 million feet of gas, which will supply, in round figures, 267 million feet at the burner. Calculated the leakage and surreptitious burning at about 16 per cent. Considered this a high rate where dry meters are used. Had contracts to supply 6400 consumers in the City for 5 years at 4s. per 1000 feet. and calculated they would consume 250 million feet, leaving 17 million feet for Whitechapel and the out-districts where many have pro-

mised to take their gas. An acre and a half more land might be had adjoining, on which additional works might be constructed capable of manufacturing 700 million feet. Messrs. Rigby had contracted for the erection of the works, of the retorts, gasholders, laying and supplying mains, and everything requisite for the manufacture of 320 million feet of gas.

By the CHAIRMAN.—The contract is on a schedule of prices; the quantities are estimated; and the result of the whole is an estimate. Believed they will have to pay Messrs. Rigby about £80,000.

Examination continued.—The total capital required for the manufacture of 320 million feet cube will be £136,000; the building and manufacturing plant will be £30,128; the mains, meter, and service, £66,266; ground purchase, £6000; contingencies, £9639; preliminary expenses, £16,000; floating capital, £8000. The following table was then handed in of the cost of manufacturing and distributing gas:—

No. 1.

ESTIMATE OF CURRENT EXPENSES AND DIVIDEND.

Dr. PRODUCTION ACCOUNT.	THE COST OF PRODUCING: 320 million Cubic Feet made from 34,782½ Tons of Coals.	1000 Cubic Feet of Gas, with a Consumption of 320 millions.
	£ s. d.	s. d.
To Coals, at 16s. per ton, producing 9200 feet per ton	27,826 1 7	1 8·87
Labour, at 3½d. per 1000 feet	4,666 13 4	3·50
Wear and tear of Retorts	2,666 13 4	2·
Lime	333 6 8	·25
Wear and tear of works and mains	2,666 13 4	2·
	38,159 8 3	2 4·62

Cr. PRODUCTION ACCOUNT.	TOTAL RESIDUAL PRODUCTS OF: 320 million Feet, made from 34,782½ Tons of Coals.	1000 Cubic Feet of Gas, with a Consumption of 320 millions.	
	£ s. d.	d.	
By surplus Coke for sale (after using 20 per cent. for heating retorts), at 10s. per chaldron	13,912 15 0	10·43	
Breeze (8 chaldrons to 100 tons of coals used), at 4s. per chaldron	556 12 0	·42	
Tar (being 10 gallons per ton of coals used), at 1d. per gallon	1,449 5 5	1·08	
	...	...	11·93
	15,918 12 5		
Total cost of production	£ 22,240 15 10		1 4·69

Dr. DISTRIBUTION ACCOUNT.	TOTAL COST OF DISTRIBUTION FOR: 320 million Feet, made from 34,782½ Tons of Coals.	1000 Feet of Gas, with a Consumption of 320 millions.	
	£ s. d.	d.	
To collection and bad debts (3 per cent. on rental)	1,600 0 0	1·20	
Rates and taxes (3 per cent. on rental)	1,600 0 0	1·20	
Law expenses	200 0 0	·15	
Stationery and incidental expenses	750 0 0	·56	
Directors	1,000 0 0	·75	
Engineers, secretaries, clerks, and inspectors	1,600 0 0	1·20	
Maintenance of works (1 per cent. on capital)	1,360 6 9	1·02	
Wear and tear of meters (7½ per cent. on their value)	754 13 9	·57	
	...	...	6·65
	8,865 0 6		
Total cost of production and distribution		31,105 16 4	1 11·34
10 per cent. dividend on a capital of £136,033. 15s. for 320 millions		13,603 6 9	10·20
Total cost	£	44,709 3 1	2 9·54

Cr. PRODUCTION AND DISTRIBUTION ACCOUNT.		
By sale of 320,000,000 cubic feet of gas, Less 53,333,333, or 1-6th, for leakage,		
266,666,667, at 4s. per 1000 feet	£ 53,333 6 8	3 4·
Being a *surplus profit*, sufficient to allow the Company to sell gas at 3s. 4½d. per 1000 feet	8,624 3 7	6·46

Has made another estimate, founded upon the manufacture of 736 million feet, which, deducting ⅛th for leakage, leaves 613 million feet for sale.:—

No 2.

ESTIMATE OF CURRENT EXPENSES AND DIVIDEND.

Dr. PRODUCTION ACCOUNT.	THE COST OF PRODUCING: 736 million Cubic Feet of Gas from 80,000 Tons of Coals.	1000 Cubic Feet of Gas from a Consumption of 736 millions.
	£ s. d.	s. d.
To 80,000 tons of coals, at 16s., producing 9200 feet per hour	64,000 0 0	1 8·87
Labour, at 3½d. per 1000 feet	10,733 6 8	3·50
Wear and tear of retorts	6133 6 8	2·
Lime	766 13 4	·25
Wear and tear of works and mains	6133 6 8	2·
	87,766 13 4	2 4·62

Cr. PRODUCTION ACCOUNT.	TOTAL RESIDUAL PRODUCTS OF: 736 million Feet of Gas, made from 80,000 Tons of Coals.	1000 Cubic Feet, with a Consumption of 736 millions.	
	£ s. d.	d.	
By surplus Coke (after using 20 per cent. for heating retorts) for sale, at 10s. per chaldron	32,000 0 0	10·43	
Breeze (8 chaldrons to 100 tons of coals used), for sale, at 4s. per chaldron	1,280 0 0	·42	
Tar (being 10 gallons per ton of coals, for sale), at 1d. per gallon	3,333 6 8	1·08	
	...	...	11·93
	36,613 6 8		
Total cost of production	£ 51,153 6 8		1 4·69

Dr. DISTRIBUTION ACCOUNT.	TOTAL COST OF DISTRIBUTION FOR: 736 million Feet of Gas, made from 80,000 Tons of Coals.	1000 Cubic Feet, with a Consumption of 736 millions.	
	£ s. d.	d.	
To lighting and repairing (City 2850, out district 856; total 3706) lamps, at 15s.	2,779 10 0	·91	
Collection and bad debts (3 per cent. on rental)	3,680 0 0	1.20	
Rates and taxes (3 per cent. on rental)	3,680 0 0	1·20	
Law expenses	300 0 0	·10	
Stationery and incidental expenses	1,000 0 0	·32	
Directors	1,000 0 0	·32	
Maintenance of works (on capital 1 per cent.), £245,000	2,450 0 0	·80	
Wear and tear of meters (7½ on value, £20,000)	1,500 0 0	·49	
Secretary, clerks, and inspectors	2,000 0 0	·65	
	...	...	5·99
	18,389 10 0		
Total for production and distribution		69,542 16 8	1 10·68
Add 10 per cent. for dividend on a capital of £245,000		24,500 0 0	7·99
Total cost	£	94,042 16 8	2 6·67

Cr. PRODUCTION AND DISTRIBUTION ACCOUNT.		
By sale of 736,000,000 feet of gas, Less 122,666,666		
613,333,334 cubic feet, at 4s. per 1000	£ 122,666 13 4	3 ·4
Being surplus profit, or sufficient to allow the Company to sell gas to the public at 3s. 0·80d. per 1000 feet	28,623 16 8	9·35

Cross-examined by Mr. BURKE.—Intended to construct two gasholders at first, 105 feet diameter, and to rise 50 feet. The average diameter would be 102 feet. They were to be telescopic, and to contain 406,000 feet each. Messrs. Rigby were to do them. It was not their regular business, but they will employ gasholder makers. Peto and Betts were the original contractors; they were to have taken 5000 shares. Did not know why they gave up the contract; perhaps Mr. Tyrrell did. Their prices were the same as Rigby's. The project of this year differs in some respect from that of last year. The quantity of gas to be made is 45 million less. The lighting of the out-

[*For continuation see Supplement.*]

Share List.

THE PRICES QUOTED ARE THOSE AT WHICH THE LAST SALES HAVE BEEN MADE.

The Companies whose names are printed in italic type are incorporated by Act of Parliament.

Number of Shares issued.	Amount per Share	Name of Company.	Amount paid up per Share	Dividend per Cent. per Ann.	Price.
	£	**ENGLAND.**	£ s. d	£ s. d	£ s. d
		Aberdare			
		Abergavenny			
		Aberystwith			
		Abingdon			
		Accrington £5500		5 0 0	
		Alcester			
		Alford, Lincolnsh.			
		Alfreton			
		Alnwick			
		Alston Moor			
		Alton			
800	5	Altrincham	5 0 0		
		Amersham			
		Amlwch			
		Ampthill			
350	10	Andover	10 0 0	6 0 0	11 0 0
		Appleby			
		Arundel			
		Ashbourn, Derby			
		Ashburton			
		Ashby-de-la-Zouch			
		Ashford, Kent			
		Ashton-under-Line £42,500		13 4 0	
		Atherstone			
		Axminster			
225	20	Aylesbury	20 0 0	5 0 0	20 0 0
		Aylsham, Norfolk			
		Bacup, Yorkshire			
		Bakewell			
		Baldock			
140	25	Banbury	25 0 0		
		Bangor			
500	5	Barking, Essex	4 10 0	5 11 0	5 0 0
250	10	Barnard Castle	10 0 0	5 10 0	10 15 0
		Barnet			
		Barnsley £6000		7 10 0	
100	20	Barnstaple	20 0 0	7 10 0	25 0 0
		Barton			
120	25	Basingstoke	25 0 0	8 0 0	28 0 0
2400	20	*Bath*	16 0 0	10 0 0	25 to 30
		Battle £2000		6 0 0	
56	26½	Bawtry	26 10 0	5 0 0	25 0 0
		Beaumaris			
		Beccles, Bungay, and Lowestoft			
		Bedford			
		Belford			
		Bedale, Yorkshire			
		Belper			
		Beminster			
		Berkhempstead			
700	5½	Berwick-on-Tweed	5 10 0	6 8 0	5 15 0
		Beverley			
		Bewdley			
280	10	Bideford	10 0 0	6 0 0	10 10 0
		Biggleswade			
		Bicester			
		Bilston £25,000			
		Billericay			
		Bingley			
		Birkenhead and Claughton £56553	35 0 0	3 7 6	32 to 34
2400	50	*Birmingham and Staffordshire*	50 0 0	8 0 0	81 to 83
	25	*Ditto*, new shares	7 10 0	8 0 0	11 0 0
704	75	Birmingham	75 0 0	10 0 0	120 0 0
		Bishop's Auckland			
		Bishop's Stortford			
		Blackburn £24,000		10 0 0	
		Blandford			
		Blythe			
		Bodmin			
		Bognor			
		Bolton £49,500		9 0 0	
		Boroughbridge			
		Boston £8000		6 0 0	
200	10	Bourn	10 0 0	5 0 0	
		Brackley			
		Bradford, Wilts			
		Bradford, Yorksh. £45,000		10 0 0	
		Brampton, Cumb.			
		Brandon, Suffolk			
		Brecon			
		Bridge-end, Glam.			
		Brierly Hill			
2250	20	*Brighton*	20 0 0	5 0 0	14 to 15
1125	20	,, new shares	16 0 0	5 0 0	
		Brighton and Hove £50,276			
4250	20	*Bristol*	20 0 0	10 0 0	37 0 0
1725	25	*Bristol and Clifton*	25 0 0	6 0 0	25 0 0
		Brixham			
		Braintree			
750	50	*Brentford*	50 0 0	6 0 0	44 to 46
800	25	,, new shares	11 0 0	6 0 0	11 0 0
		Brentwood			
		Bridgwater £6000		5 0 0	
400	10	Bridlington	10 0 0		8 0 0
		Bridport			
		Brigg			
		Broadstairs			
100	50	Bromley, Kent	50 0 0	6 0 0	52 10 0
		Bromsgrove			
120	10	Bruton	10 0 0	4 0 0	8 0 0
100	25	Buckingham	25 0 0	5 0 0	25 0 0
		Bungay (see Beccles)			
		Burford			
		Burlington			
		Burnley £19,946			
		Burslem			
		Burton-on-Trent			
		Bury St. Edmund's			
		Bury, Lanc. £6570			
		Buxton			
		Callington			
		Calne, Wilts			
		Camborne			
		Cambridge £32,000		7 0 0	
240	50	*Canterbury* Gas and Water	50 0 0	6 0 0	57 to 58
240	25	*Ditto*, second issue	25 0 0	6 0 0	28 to 29
		Cardiff £10,500		7 10 0	
		Carmarthen			
		Chapel on the Frith			
		Chard			
		Chatham (see Rochester)			
		Chatteris			
		Cheadle			
		Chelmsford			
		Cheltenham £17,242		8 10 0	
		Chepstow			
		Chertsey			
		Chesham, Bucks			
		Chester			
		Chester-le-Street			
		Chesterfield £12,023			
240	25	Chichester	25 0 0	6 0 0	30 0 0
		Chippenham			
		Chipping Norton			
		Chirk			
		Chorley			
		Chudleigh			
		Cirencester			
		Clifton (*Bristol and Clifton*)			
		Cleckheaton, York.			
		Clitheroe			
		Cockermouth			
		Colchester			
		Collumpton			
		Colne, Lancashire			
		Coleford, Gloucest.			
		Coggeshall			
		Congleton £5000		7 10 0	
		Cowbridge			
800	25	*Coventry*	25 0 0	5 0 0	20 0 0
		Cowes			
		Crewkerne			
		Croydon			
		Cranbrook £1900		5 0 0	
		Crediton			
		Crewe, Cheshire			
		Cricklade			
		Darlaston			
		Darlington			
250	20	Dartford	20 0 0	7 10 0	27 0 0
		Dartmouth			
125	20	Daventry	20 0 0	6 0 0	24 8 0
		Dawley, Shrop.			
		Dawlish			
500	6	Denbigh	6 0 0	5 0 0	6 0 0
820	10	Deptford, Bermondsey, and Rotherhithe	10 0 0	5 0 0	4 10 0
325	50	*Derby*	50 0 0	10 0 0	
90	20	Dereham (East)	20 0 0	4 10 0	
1000	5	*Dewsbury*	5 0 0	7 10 0	8 12 6
		Devizes			
4000	5	*Devonport*	5 0 0	6 0 0	6 5 0
		Diss			
		Doncaster			
280	25	Dorchester	25 0 0	5 0 0	25 0 0
120	25	Dorking	20 10 0	5 0 0	21 10 0
		Douglas, Isle of M.			
209	56½	*Dover*	56 10 0	4 8 6	50 0 0
		Downham			
		Driffield			
		Droitwich			
600	20	*Dudley*	20 0 0	4 0 0	15½ to 16½
		Duumow			
		Dunstable			
		Durham			
276	9	Dursley, Gloster	9 0 0	5 10 0	8 0 0
		Elland			
		Ellesmere			
		Enfield			
300	19	Epsom	19 0 0		
		Evesham			
		Exeter £40,000		8 0 0	
		Exmouth			
		Eye, Suffolk			
		Fakenham			
		Falmouth			
		Fareham			
120	25	Farnham	25 0 0	10 0 0	42 0 0
		Farringdon			
		Faversham			
		Ferrybridge			
		Fleetwood			
		Folkestone			
		Fowey			
		Framlingham			
		Frome			
		Garstang			
		Gillingham, Dorset			
		Glastonbury			
		Glossop £6000		7 0 0	
		Gloucester £24,600		7 10 0	
		Gomersal			
		Godalming			
		Gosport			
		Grantham			
		Gravesend			
1000	10	*Great Grimsby*	6 10 0	8 0 0	8 5 0
		Guildford			
		Guisborough			
		Hadleigh			
		Hales Owen			
300	6	Halesworth	6 0 0	7 10 0	5 10 0
		Halifax £15,000		8 0 0	
		Halstead			
		Harleston			
		Harrogate £10,000			
		Hartlepool £7835		7 0 0	
		Haslingden, Lansh.			
330	50	Hastings and St. Leonard's	50 0 0	6 0 0	60 0 0
		Haverfordwest			
		Haverhill			
		Haworth, Yorks.			
		Hoyle			
		Helstone			
		Hemel Hempstead			
300	10	Henley-on-Thams.	10 0 0		
		Hereford £5300		4 0 0	
		Herne Bay			
270	10	Hexham	10 0 0	7 0 0	12 0 0
		Heywood £10,000		7 10 0	
230	10	Hinckley	10 0 0	5 0 0	7 0 0
		Hindley, Lancash.			
		Hitchen			
		Hythe			
		Hoddesden			
		Holbeach			
		Holmfirth £8325		6 0 0	
		Holyhead			
		Holywell (see British Provincial)			
		Honiton			
		Horncastle			
10		Houghton-le-Sprg.	10 0 0	8 0 0	
		Horsham			
		Howden			
		Hull, Sculcoats (see British Provin.)			
		Hull, £11,712, 10s.		8 0 0	
		Hungerford			
		Huddersfield			
520	5	High Wycombe	5 0 0		5 0 0
		Hyde, Cheshire			
		Ilminster			
		Ilford			
		Ilfracombe			
		Ironbridge			
1400	10	*Ipswich*	10 0 0	8 0 0	15 0 0
1400	10	,, new shares	5 0 0	8 0 0	
800	25	*Isle of Thanet* (Ramsgate&Mar.)	20 0 0	5 0 0	20 to 21
		Kendal £7600		7 10 0	
		Kenilworth			
		Keswick			
100	25	Kettering	25 0 0	5 0 0	25 0 0
		Kiddermins. £8000		5 0 0	
		King's Langley			
		Kington, Hereford			
		Kirkby Lonsdale			
		Kirkham, nr. Preston			
		Knutsford			
		Lancaster			
		Llanelly			
		Llandovery			
		Leamington Priors £20,000		6 0 0	
		Leatherhead			
		Ledbury			
		Leeds Old Comp. old stk., £60,300		10 0 0	
		new ,, £11,527		6 0 0	
		Leeds New Comp.			
		Leek			
		Leicester		7 0 0	
		Leigh			
125	20	Leighton Buzzard	20 0 0	5 0 0	
		Leominster			
		Leyburn, Yorksh.			
		Liskeard			
330	25	Lewes	25 0 0	5 0 0	23 0 0
		Lincoln £8000		10 0 0	
		Leyland, Lancash.			
		Littlehampton			
250	20	Lichfield	20 0 0	7 10 0	27 10 0
		Liverpool United	100 0 0	9 0 0	174 to 176
		,, ¼ sh.	25 0 0	9 0 0	43¾ to 43¾
		Langport			
		London Comps.—			
5000	40	*British*	18 0 0	5 11 1	13 to 14
		,, debentures		4 0 0	
5000	20	,, Prov.—(Ayr, Clonmel, Gloucester, Holywell, Hull, Norwich, Stoke, Trowbridg)	20 0 0	7 0 0	18 to 20
	20	,, Prov., new	3 0 0	7 0 0	3 to 5
	25	*Commercial*	25 0 0	6 0 0	23 to 25
	25	,, new shres	10 0 0	6 0 0	½ dis.
	25	,, ,,	2 10 0	6 0 0	½ dis.
12,000	50	*Chartered*	50 0 0	6 0 0	45 to 47
6000	50	,, new shares	10 0 0	6 0 0	9 to 9½
1000	100	*City of London*	100 0 0	6 0 0	
1000	100	,, new shares	75 0 0	6 0 0	
4000	50	*Equitable*	50 0 0	2 10 0	25 to 28
10,000	20	European—(Amiens, Boulogne, Caen, Havre, Nantes, and Rouen)	20 0 0	5 0 0	9 to 10

Number of Shares issued.	Amount per Share	Name of Company.	Amount paid up per Share	Dividend per Cent. per Ann.	Price.
	£		£ s. d	£ s. d	£ s. d
8000	50	*Impl. Continental* —(Amsterdam, Aix-la-Chapelle Antwerp, Berlin, Bordeaux, Brussels, Cologne, Frankft., Ghent, Haarlem Hanover, Lille, Marseilles, Rotterdam, Toulouse, Vienna)	42 0 0		40 to 43
7000	50	„ new shares	38 0 0		44 to 46
	50	„ third issue	42 10 0		40 to 45
10,000	50	*Imperial*	50 0 0	6 0 0	68 to 70
		„ debentures			
4000	40	*Independent*	40 0 0	6 0 0	47 to 49
8000	25	*London*	25 0 0		9 to 12
6000	25	„ preference	25 0 0	6 0 0	20 to 23
9000	50	*Phœnix*	47 0 0	4 10 0	27 to 29
1000	100	*Ratcliff*	90 0 0	5 0 0	70 to 73
4000	25	*South Metrop.*	25 0 0	6 0 0	23 to 24
9000	50	United General—(Cork, Dublin, Limerick)	50 0 0	2 0 0	14 to 15
12,500	20	Western	15 0 0		7 0 0
		Lostwithiel			
		Loughborough			
240	25	*Louth*	25 0 0	6 0 0	26 10 0
		Lowestoft (see Beccles)			
611	5	Ludlow Union	5 0 0	6 0 0	5 0 0
		Luton			
		Lyme Regis			
		Lymington			
		Malmesbury			
		Macclesfield £20,000		4 13 5	
		Maidenhead			
250	50	Maidstone	50 0 0	10 0 0	100 0 0
		Maldon			
		Marlborough			
		Malton (New)			
		Malvern			
		Manningtree			
		Mansfield £5000		10 0 0	
		March			
		Margate (see I. of T.			
		Market Deeping			
132	25	Market Harboro'	25 0 0	6 0 0	30 0 0
		Market Raisin			
		Market Weighton			
		Marlow			
370	10	Maryport	10 0 0	6 0 0	12 0 0
		Melksham			
		Melton Mowbray			
		Merthyr Tydvil			
		Mere			
		Middleton £5000			
		Midsummer Norton			
		Middlesboro'			
		Mildenhall			
		Mitcham			
		Mold			
700	10	Monmouth Gas and Water	10 0 0	5 0 0	
		Monk Wearmouth			
		Moreton in Marsh			
		Morley			
		Nantwich			
		Neath			
		Needham Market			
		Newark £5000		10 0 0	
250	20	Newbury	20 0 0	5 0 0	20 0 0
13,000	5	Newcastle & Gateshead Union	5 0 0	10 0 0	6 12 6
		Newcastle-under-Lyne £5000		5 0 0	
600	5	Newmarket	5 0 0	6 0 0	5 0 0
		Newnham, Glost.			
		New Mills & Hayfield £2115			
		Newport, Mon.			
320	50	*Newport, Isle of W.*	38 0 0	4 0 0	19 to 20
		Newport Pagnell			
		Newport, Salop			
		Newton Abbot			
		Newton, Lanc.			
		Northallerton			
		North Walsham			
		Northampton			
		Northwich			
		Norwich (see British Provincial)			
900	50	*Nottingham*	50 0 0	10 0 0	
900	50	New shares		10 0 0	
		Nuneaton			
		Oakham			
		Oakhampton			
200	10	Odiham, Hants	10 0 0	3 10 0	10 0 0
		Oldham			
		Ongar			
		Ormskirk			
		Otley, Yorkshire			
		Oundle			
		Oxford £18,000		9 10 0	
		Over Darwen £8000		5 0 0	
		Padstow			
		Pately Bridge, Yrk.			
250	20	Penrith	15 0 0	6 10 0	21 0 0
		Penryn			
		Penzance			
		Pershore			
200	10	Petworth	10 0 0	9 10 0	12 0 0
		Pickering			
3000	10	*Plymouth & Stonehouse*	10 0 0	6 0 0	11 0 0
		Pocklington			
		Pontefract			
		Pontypridd			
400	10	Poole	10 0 0	5 0 0	10 0 0
		Port Madoc			
600	50	*Portsea Island*	53 0 0	5 0 0	45 to 47
400	10	Prescott	9 0 0	4 13 4	7 0 0
		Preston £52,500		10 0 0	
		Pwllheli			
		Pontypool			
		Pudsey			
		Radcliff and Pilkington £9000		4 12 10	
		Ramsay, I. of Man			
		Ramsgate (see Isle of Thanet)			
		Ravenglass			
1000	10	*Reading*	10 0 0	3 0 0	7 0 0
500	20	*Reading Union*	20 0 0	6 0 0	17 0 0
		Redditch			
		Redruth			
		Reigate			
		Retford (East)			
		Rhyl			
		Richmond, Surrey			
		Ripon			
		Rochester and Chatham £14,000		6 0 0	
		Rochford			
		Rockingham			
		Romford			
		Ross			
		Rotherham £4000		10 0 0	
		Royston			
		Ruabon			
		Rugby			
		Rugeley			
		Ruthin			
		Runcorn			
500	10	Ryde	10 0 0	6 0 0	12 0 0
		Rye			
		Romsey			
		Saddleworth			
225	20	Saffron Walden	20 0 0	3 15 0	19 0 0
		St. Austel			
		St. Asaph			
		St. Colomb			
		St. Helen's £7200		5 0 0	
		St. Ives, Hunting.			
		St. Ives, Cornwall			
		St. Neot's			
320	25	Salisbury	25 0 0	6 0 0	28 to 30
		Sandbach			
		Saxmundham			
		Scarborough			
		Seaham			
		Selby			
		Settle			
290	10	Sevenoaks	10 0 0	5 0 0	10 0 0
		Shaftesbury			
5400	25	*Sheffield United*	24 0 0	8 6 4	32 0 0
		Shelton, Potteries (see Brit. Prov.)			
		Shepton Mallet			
		Sherborne			
2914	5	Shields, North (Tynemouth)	5 0 0	3 0 0	5 0 0
		Shields (South)			
		Shiffnal, Salop			
		Shipley			
		Shipston-on-Stour			
		Shoreham			
		Shrewsbury £10,000		7 0 0	
400	10	Skipton	10 0 0	4 0 0	11 0 0
		Sleaford			
		Slough			
		Snaith			
		Soham			
		Southwold			
		South Molton			
1000	50	*Southampton*	32 0 0		
		Sowerby, Yorksh.			
		Stretford			
		Stokesly			
		Stafford £10,000			
		Staines and Egham			
		Staley Bridge £15,000		10 0 0	
		Stamford £11,250			
		Stockport £34,200		7 11 0	
		Stockton-on-Tees £3600		8 0 0	
840	9½	Stockton, New	9 10 0		8 0 0
960	10	Stoke-upon-Trent	10 0 0	6 10 0	12 0 0
500	10	„ new shares	3 0 0	6 10 0	5 0 0
		Stone, Stafford			
		Stoney Stratford			
		Stourbridge			
		Stowmarket			
150	20	Stratford-on-Avon	20 0 0	7 10 0	30 0 0
		Stroud			
169	10	Swaffham	10 0 0	5 0 0	5 10 0
		Swansea £9000			
		Sudbury			
		Sunderland, old			
6400	5	*Sunderland*, new	5 0 0		
		Swindon			
2800	5	*Taunton*	5 0 0		2 10 0
		Tadcaster			
		Tamworth			
		Tavistock			
		Teignmouth			
		Tenbury			
		Tenby			
		Tenterden £2000		2 10 0	
		Tetbury, Gloster			
		Tewkesbury			
		Thame			
		Thetford			
		Thirsk			
		Thornbury			
		Thorne			
		Tiverton			
670	5	Todmorden	3 0 6		
		Torquay			
		Torrington, Devon			
		Totnes			
		Totnes and Bridgetown Consumers			
	5	Tottenham	3 10 0	6 0 0	3 0 0
		Towcester			
		Tring			
		Trowbridge (see British Provin.)			
75	50	Truro	50 0 0	2 0 0	
		Tunbridge			
		Tunbridge Wells			
		Ulverston			
		Uppingham			
		Usk, Monmouth			
		Uttoxeter			
		Uxbridge			
1000	25	*Wakefield*, old capl	25 0 0	6 0 0	24 0 0
1600	5	new „	5 0 0	6 0 0	4 16 0
300	10	Wallingford	10 0 0	5 0 0	8 0 0
		Wandsworth			
		Wantage			
		Warrington £18000		10 0 0	
100	10	Wareham	10 0 0	3 10 0	8 0 0
120	25	Warminster	25 0 0	5 0 0	27 0 0
		Warth			
		Warwick £15,000		6 0 0	
		Watford			
		Welchpool, Mutgy.			
		Wellingborough			
		Wellington, Salop			
		Wellington, Smrst.			
		Wells, Smrst. £4000		6 0 0	
		Westbury			
		Weston-sup.-Mare			
2000	5	West Ham	5 0 0	6 0 0	5 0 0
		Whitby			
		Whitehaven			
		Whittlesea			
		Wigan £10,160		5 0 0	
		Willenhall			
		Winchelsea			
		Winslow			
240	10	Wimborne Minster	10 0 0		
		Wincanton			
360	50	Winchester	50 0 0	6 0 0	
900	12½	Windsor	12 10 0	10 0 0	23 0 0
		Witham			
		Witney			
4448	10	*Wolverhampton*	10 0 0	7 10 0	11 10 0
		Woburn			
210	10	Wokingham	10 0 0		10 0 0
		Woodbridge			
		Wooler			
		Wotton-un.-Edge			
		Worcester			
		Workington			
		Worksop and Radford			
		Wirksworth			
		Worthing			
		Wrexham			
		Woolwich			
		Woolwich Consms.			
		Woolwich (North)			
		Wymondham			
		Yarm			
795	20	Yarmouth	20 0 0		15½ to 16½
		Yeovil			
		York Untd. £35,000			
		SCOTLAND.			
		Aberdeen			
		Airdrie			
		Alloa			
		Annan			
		Anstruther			
		Ardrossan			
550	20	Arbroath	20 0 0	7 10 0	27 10 0
		Auchterarder			
		Auchtermuchty			
		Ayr, old (see Brit. P.			
		Ditto, new			
		Banff			
		Barrhead			
		Bathgate			
		Beith			
		Bervie			
		Biggar			
		Blairgairie			
300	6	Borrowstowness	6 0 0	5 0 0	8 0 0
		Brechin			
		Bridge of Allan			
		Broughty Ferry			
		Burntisland			
		Calien			
		Campbelton			
		Clackmannan			
		Coatbridge			
		Coldstream			
		Collinsburgh			
		Crieff			
		Crail, Fife			
		Cumbernauld			
		Cumnock			
600	5	Cupar Angus	5 0 0	6 0 0	5 10 0
250	10	Cupar Fife	10 0 0	7 10 0	14 0 0
		Dalkeith			
		Dingwall			
		Dornoch			
		Douglas			
		Dumbarton			
400	20	Dumfries	14 0 0	5 0 0	20 0 0
		Dunbar			
		Dunblane			
		Dundee, old			
		„ new			
860	10	Dunfermline	10 0 0	6 0 0	12 12 0
		Dunkeld			
		Dunse			
		Dysart			
6000	25	*Edinburgh Gas Co.*	25 0 0	10 0 0	45 0 0
		„ *and Leith Co.* £150,000		6 10 0	
		Elie			

Number of Shares issued.	Amount per Share	Name of Company.	Amount paid up per Share	Dividend per Cent. per Ann.	Price.
	£		£ s. d	£ s. d	£ s. d
		Elgin			
		Falkirk, old			
		,, new			
		Falkland			
		Ferry Port on Craig			
		Fochabars			
		Forfar			
		Fort William			
		Fraserburgh			
		Galashiels			
		Garliston			
		Gatehouse n. Fleet			
		Girvan			
		Glasgow £129,500		5 0 0	
15000	10	*Glasgow City and Suburban*	9 0 0	7 10 0	9 0 0
		Grangemouth			
		Haddington			
		Hamilton			
		Hawick			
		Helensburgh			
		Huntley			
		Inverary			
400	1	Inverkeithing	1 0 0	5 0 0	1 0 0
1200	10	*Inverness Gas and Water*	10 0 0	8 0 0	15 0 0
2400	5	,, new shares	1 5 0	8 0 0	2 5 0
		Irvine			
		Jedburgh			
		Johnstone, near Paisley			
		Keith			
		Kelso			
		Kilmarnock			
		Kincardine			
		Kinghorne			
		Kingskittlo, Fife			
		Kinross			
		Kirkaldy			
320	5	Kirkcudbright	5 0 0	5 0 0	5 0 0
1000	3	Kirkintulloch, near Glasgow	3 0 0	5 0 0	3 0 0
227	5	Kirkwall	5 0 0	5 0 0	4 10 0
518	5	Kirriemuir	5 0 0	6 0 0	
		Lanark			
		Largo, near Leven			
		Largs			
		Lasswade, n. Edin.			
		Lauder			
		Leith			
		Leslie, Fife			
		Lesmahago			
		Leven			
		Linlithgow			
		Linton, n. Nobleh.			
		Lochee, n. Dundee			
		Lochgilphead			
		Lochwinnock, near Paisley			
1200	1	Markinch	1 0 0	7 10 0	1 5 0
		Mauchline			
		Maxwell-town, n. Dumfries			
		Maybole, Ayrshire			
		Maryhill, near Glasgow			
		Melrose			
718	2	Mid & East Calder	2 0 0		2 0 0
192	5	Moffat	5 0 0		
		Montrose			
		Musselburgh			
		Nairn			
		Neilston, n. Glasg.			
		Newmiles, near Kilmarnock			
		Newburgh, Fife			
		Newton Stewart			
		North Berwick, n. Haddington			
		North Queensferry			
		Oban			
		Peebles			
800	25	Perth	25 0 0	1 4 0	22 10 0
		Peterhead			
		Pittenweem			
		Pollokshaws, near Glasgow			
		Port Glasgow			
		Portobello, near Edinburgh			
		Prestonpans			
		Rutherglen, near Glasgow			
		Renfrew, n. Paisley			
		Saltcoats			
		Sanquhar			
		Selkirk			
		South Queensferry			
		St. Andrew's			
		Stewarton			
		Stirling			
		Stonehaven			
		Stonhouse, Lanrks.			
		Stornway			
		Stranraer			
		Strathaven, near Hamilton			
		Thurso			
		Tillicoultry, n. Allon			
800	1	Tranent	1 0 0		1 0 0
		Troon			
		Wick			
		Wigton			
		Wemyss	4 10 0		
		IRELAND.			
300	10	Armagh	10 0 0	8 0 0	14 10 0
		Ballinasloe			
700	50	*Belfast*	50 0 0		
		Ballymena			
		Carrick-on-Suir			
		Carrickfergus			
		Carlow, new			
		Cork (see United General)			
		Clonmel (see British Provincial)			
		Clonmel Consumrs			
		Drogheda			
19,000	10	*Dublin Consumers*	5 0 0	6 0 0	5 0 0
		Dublin Hibernian (see United Gen.)			
160	25	Dundalk	25 0 0		22 0 0
		Dungannon			
1000	5	*Downpatrick*	5 0 0		
		Enniskillen			
		Galway			
400	10	Kilkenny	10 0 0	8 0 0	11 5 0
		Limerick (see U.G.			
1725	5	Limerick Consum.	5 0 0	5 0 0	5 0 0
600	15	Londonderry	15 0 0	6 13 4	21 10 0
300	6½	Lisburn	6 0 0	5 0 0	6 5 0
520	10	Lurgan	6 0 0	6 0 0	6 0 0
		Mallow			
		Monaghan			
		Nenagh			
448	5	Newtownards	5 0 0	4 0 0	5 0 0
		New Ross			
		Newry			
		Omagh			
125	20	Portadown	20 0 0	5 0 0	20 0 0
600	10	Sligo	10 0 0		
		Tipperary			
		Tralee			
		Waterford			
		Wexford			

The Gas Works in the undermentioned towns belong to private individuals:—

Bridgenorth.	Farsley.	Huntingdon.	Peterborough.	Sidmouth.	Ware.
Carlow, old.	Gainsborough.	Kingston-on-Thames.	St. Alban's.	Sittingbourne.	Wem.
Carnarvon.	Goole.	Lynn.	Sandwich.	St. Peter's Port, Guernsey.	Weymouth.
Deal.	Hertford.	Morpeth.	St. Helier's, Jersey.	Spalding.	Whitchurch (Salop).
Ely.	Holt.	Oswestry.	Sheerness.	Waltham Abbey.	Wisbeach.

The Gas Works belong to the Corporations, or to Commissioners acting under special acts of Parliament, in the following towns:—

Carlisle.	Keighly.	Manchester.	Rochdale.	Salford.	Walsall.
Cashel.	Knaresborough.	Milton (Kent).	Rothesay.	Southport (Lanc.)	Wells (Norfolk).
Coleraine.	Lytham (Lanc.)	Paisley.	Richmond (Yorkshire).	Strabane.	Youghall.
Greenock.					

Price Current.

The following List of Prices is corrected by an eminent wholesale house in each trade up to the latest period:—

CASTINGS, per Ton.

Average Weight of Cast Iron Pipes, per Yard.

1¼ in.	2 in.	2½ in.	3 in.	4 in.	5 in.	6 in.	7 in.	8 in.	9 in.	10 in.	12 in.
16	21	28	33	51	70	89	107	126	149	177	208 lbs.

Retail Prices are 5 to 10 per cent. higher.	London.	Glasgow	Newcastle.	Wales.	Yorksh., Derbysh., and Staffrdsh.
	£ s. d.	£ s. d.	£ s. d.	£ s. d.	£ s. d.
Pig Iron, No. 1	3 7 6	2 10 0	3 0 0	3 15 0	3 10 0
1¼ and 2 inches Socket Pipes	6 0 0	5 0 0	5 10 0	5 15 0	5 15 0
2½ and 3 do. do.	5 17 6	4 17 6	5 7 6	5 12 6	5 12 6
4 and 5 do. do.	5 15 0	4 15 0	5 5 0	5 10 0	5 10 0
6 inches and upwards do.	5 12 6	4 15 0	5 2 6	5 7 6	5 7 6
Extra for bends, branches, and connection	2 0 0	2 0 0	2 0 0	2 0 0	2 0 0
Retorts, 1st fusion	5 5 0	..	..	4 17 6	5 0 0
Do. 2nd fusion	5 15 0	4 10 0	4 17 6	5 5 0	5 5 0
Tank Plates, ¼ thick and above	5 10 0	4 17 6	5 0 0	5 7 6	5 17 6
Do. less than ¼	5 15 0	5 0 0	5 0 0	..	5 10 0
Plain Castings ex. models	5 15 0	5 0 0	5 0 0	5 10 0	5 10 0

COALS.

NEWCASTLE. Unscreened.	s. d.	DERBYSHIRE. Unscreened.	s. d.
Tyne Main	5 6 per ton.	Clay Cross	6 6 per ton.
Ravensworth Pelaw	5 9 ,,	Deep Main	
Dean's Primrose		New Birchwood	
Pelton	6 0 ,,	New Shipley	
Brancepeth		Sleight's	
Medomsley		SCOTCH CANNEL.	
New Tanfield		Kirkness best	23 0 ,,
Pelaw	6 3 ,,	Lothian	18 0 ,,
Eighton Moor	6 6 ,,	Lesmahago at Glasgow	16 6 ,,
Felling Main		Ditto at Leith	18 0 ,,
New Pelton		Wemyss	15 0 ,,
Peareth		Dombristle	12 0 ,,
South Pelaw		Lethans	
Waldridge		Bridgeness	11 0 ,,
South Peareth		Kinneil	
Ramsay's Cannel	12 0 ,,	Lochgelly	10 0 ,,
		Lumphumans	

FIRE GOODS.

Best Fire Bricks, 50s. per thousand, at Newcastle.
Do. Clay, 12s. per ton do.

WROUGHT IRON TUBING, subject to 30 per cent. Discount.

	2 inches.	1½ inch.	1¼ inch.	1 inch.	¾ inch.	½ inch.
	s. d.	s. d.	s. d.	s. d.	s. d.	s. d.
Patent welded tubes, from 4 to 12 feet, per foot	1 8	1 0	0 10	0 7	0 5	0 4½
Ditto ,, 2 to 4 feet	One	penny	per foot	extra.		
Ditto ,, 6 in. to 18 in., each	3 0	2 0	1 9	1 3	1 0	0 9
Connecting pieces, or long screws	3 6	2 3	2 0	1 6	1 2	0 11
Bends, springs, and elbows, wrought iron	3 9	2 3	1 9	1 0	0 10	0 8
Tees, wrought or cast	4 0	2 6	2 0	1 6	1 1	0 10
Crosses, wrought or cast	4 6	3 0	2 6	2 0	1 6	1 2
Iron cocks	17 6	9 6	7 6	4 6	3 3	2 6
Ditto, with brass plug	28 0	16 0	13 0	7 0	5 6	4 6
Diminishing sockets, caps, plugs, and nipples	1 3	0 9	0 8	0 6	0 5	0 4
Plain sockets	1 0	0 8	0 7	0 5	0 4	0 3
Flanches	1 9	1 6	1 3	1 0	0 9	
Syphons, ½ quart	15 0	14 0	13 6	13 0	12 0	
Ditto 1 quart	11 0	10 0	9 6	9 0	8 6	

Stocks, dies, and taps, for 2 inch, 1½ inch, and 1¼ inch tubing ..... £8 10s. 0d. per set.
Ditto, do. and do. ,, 1 ,, ¾ ,, and ½ ,, ,, ... 5 5 0 ,,
Ditto, do. and do. ,, ¾ ,, 2-8 ,, and ½ ,, ,, ... 3 0 0 ,,

FREIGHTS, per Ton.

Coastwise—Newcastle.	s. d.		s. d.
Chatham & Roches.	5 0	Teignmouth	7 6
Cork	8 6	Weymouth	7 6
Dartmouth	7 6	Yarmouth	5 0
Dover	5 6	*Foreign.*	
Dublin	8 6	Amsterdam	9 0
Exeter Quay	8 6	Antwerp	8 0
Faversham	5 9	Boulogne	7 0
Folkestone	6 0	Barcelona	20 0
Hastings	7 0	Bordeaux	10 6
Ipswich	5 6	Calais	7 0
Jersey	8 6	Christiana	7 0
London	5 3	Dieppe	7 6
Lowestoft	5 6	Hamburg	6 10
Lynn	6 0	Havre	7 9
Limerick	9 0	Lisbon	11 0
Margate	6 0	Naples	19 0
Portsmouth	7 3	Rotterdam	7 6
Plymouth	7 0	Rouen	11 0
Southampton	7 6	St. Petersburgh	11 0
Totnes	7 6	Stettin	9 6
		Trieste and Venice	23 0